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THORACIC PAINS.*

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Paroxysmal thoracic pains are usually diagnosed as angina pectoris. Yet all paroxysmal thoracic pains do not signify angina pectoris. Errors of diagnosis in this respect are most common. Frequently these pains are benign and they may be caused by pathologic factors independent of lesions of the heart and aorta. An unqualified diagnosis of all thoracic pains of the chest is as great an avowal of ignorance as is the diagnosis of functional neurosis and hysteria in cases having a definite though unrecognized underlying pathology.

We will first consider the true angina pectoris. What is it? What is its pathology? These questions are still unanswered. Angina pectoris is a diseased condition having definite symptoms with indeterminate and variant pathology. It is a syndrome and not a disease. Many theories are advanced as to its cause, and whilst they all differ radically, I am of the opinion that they are correct in so far as each may occasionally be correctly considered the pathogenic cause of the angina pectoris.

The following are the five principal theories explaining the pathologic cause of angina pectoris:

(1) The coronitis theory.

(2) The aortitis theory.

(3) Cardiac distention. (Merklen's theory)

(4) Myocardial exhaustion. (Mackenzie's theory)

(5) Fatigue of the myocardium. (Danielopolu theory)

A narrowing or an obliteration of the lumen of the coronary artery resulting from a coronitis or from an aortitis spreading to the orifices of the coronary arteries, with concomitant myocardial ischemia causing an alteration in the muscles of the heart especially at its apex and at its septum, is conceded to be the most frequent cause of angina. In the largest majority of cases this pathology is found in autopsies.

It is thought that the resulting ischemia causes pain either by the accumulation of toxic substances in the myocardium, or by the distention of a weakened heart muscle. The underlying pathology is usually a fibrosis or a sclerosis, a thrombosis or embolism of the coronary arteries. Obendorfor concluded from observations made on fourteen cadavers that in the majority of these patients who died of angina pectoris, there was a narrowing or an obliteration of the lumen of the coronaries, with many spots of anatomical changes in the musculature of the heart, especially at its apex and septum. Elizabeth Pauli demonstrated that the anatomical cause of angina pectoris is due to a disturbed nutrition of the cardiac muscles caused by infarcts, parietal aneurysms (especially of the sep-

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tum and apex) resulting from coronary sclerosis. Also that an exaggerated irritation of the nerves and ganglions in the wells of the vessels cause an active vasoconstriction with resulting ischemia which provokes the crisis of angina pectoris.

Weckenbach said that the theory of coronary sclerosis as a causative factor of angina pectoris is weakened by the fact that many cases of angina have shown no coronary lesion, whilst many cases of coronary sclerosis have never had symptoms of angina pectoris. His argument is refuted by many authorities who hold that the coronary changes may be so insidious that a collateral circulation may be established through its anastomotic vessels.

Degenerative changes of the coronary arteries may be either in patches or uniformly distributed throughout the myocardium. Changes in the elasticity and distensibility of the coronary arteries lessen the blood supply to the heart muscle, yet the degenerative process due to senility will also affect these as well as other arteries; however, angina pectoris is found only in a very small proportion of the aged.

Singer has demonstrated on dogs that ischemia of the heart muscle does not cause pain, and also that, whilse the pericardium, aorta and coronaries are sensitive to pain. that the ligation of these vessels causes pain only when their adventitia is preserved. I had the opportunity to observe a man with an ectopic heart. That organ, because of a congenital malformation of the sternum, was devoid of its bony protection and was only covered with atrophied muscles and skin, which corresponded to about the thickness of the skin on the dorsal surface of the hand. Freezing with ethyl chloride over the heart (to the extent of snow formation) caused no pains whatsoever, although the rate of the heart was reduced from 85 to 40 per minute in three minutes time. Doubtless the cold penetrated to the heart and produced sudden ischemia of at least the exposed portion of the organ. Handling, freezing, pressing and tapping of that heart was absolutely unproductive of pain.

Usually the ischemia produced by a thrombosis or embolism of the coronary arteries gives a different clinical picture of the angina pectoris caused by other factors, although the ischemia so produced is very rapid. Allbutt stated that the coronary arteries and the myocardium have nothing to do with the pain of angina, but much to do with its mortality, and that in young persons with a normal myocardium the heart usually survives the inhibition. Weckenbach claims that the theory of coronitis should be rejected unless there be a thrombosis or embolism of those arteries to provoke pain.

Syphilis is the most frequent cause of disease of the proximal portion of the aorta, and is frequently a cause of angina. Aortitis may result from various sources of infection. Angina pectoris may be caused by a dilatation of the ascending aorta due to high blood pressure, or to a widening of the arch of the aorta caused by the hypertension. In either case, the stretching of the lumen of and the pressure within the aorta, provoke the paroxysm of pains. These cases usually improve with the correction of the contributing cause.

Frequently in autopsies serious aortic lesions are discovered without ever giving a history of angina pectoris, although the aortitis may be located near the orifices of the coronary arteries, a region rich in its nerve supply.

Merklen's angina pectoris is usually that of the decubitus. It occurs generally during the night when the patient is roused from his sleep by violent thoracic pains, which are not provoked by movement or eased by immobility. The patient is cyanotic, cold and clammy. The orthopnea is intense. The pulse is weak, rapid and irregular. Extra-systoles are present and the gallop rhythm is frequently heard; all signs of left ventricle insufficiency. The patient

is in great dread of impending death. The left ventricle will usually be found enlarged. The thoracic pains are caused by an acute dilatation of the left ventricle distending the aorta at its origin. When the heart resumes its normal size the pains gradually subside. A frequent cause of death in these cases is pulmonary edema, which is ushered in by paroxysmal cough, rattling in the throat, bloody mucus, expectorations and moist rales all over the chest. Yet acute dilatation of the left ventricle very frequently causes death without presenting symptoms of angina pectoris of the decubitus.

Mackenzie said that as we are ignorant of the cause of angina pectoris, the pain can best, for practical purposes, be considered an expression of exhaustion of the heart muscle, and, the angina, by compelling the sufferer to be careful and wary in his efforts, or to cease form effort, may be spoken of as protective in purpose. He also stated that there are cases in which the pain appears where the heart has not been exposed to particular effort, but in which there is a history of a long period of over-exertion preceding the onset of the angina. Even in the young and healthy this pain may be normally induced by excessive exercises; but the most frequent conditions provoking angina pectoris are the degenerative changes which accompany advancing years. However, the great majority reach the ripe old age with its structural changes in the blood vessels and the heart, with cardiac decompensation and impaired circulation without ever presenting symptoms of angina pectoris.

Danielopolu stated that fatigue of the myocardium is analogous to fatigue of the voluntary muscles, and that the intoxication of the neuro-muscular myocardium by the products of fatigue is caused by impaired nutrition of the heart. Normal contraction of all hollow organs are painless and insensible, whilst violent contractions or spasms cause pains. Violent heart contractions give palpation, shock, suffocation, and sometimes paroxysmal angina. Pains are produced in hollow organs in two different ways, one by distension and the other by hyper-contractibility. This rule applies also the heart.

Whilst the theory may explain the cause of pain in some cases of angina pectoris, it does not furnish a satisfactory explanation of the pathology of the dreadful disease.

The symptomatology of the most typical type, the angina pectoris of effort is:

(1) Pain. A feeling of constriction, a squeezing in of the ribs, a tearing, piercing agonizing pain in the chest, or a burning sensation, usually of very short duration, lasting for only a few minutes, but the suffering persisting in many cases for hours.

(2) The pains are always in the chest, substernal, at the upper portion and to the left of the manubrium. They then spread to the back, and radiate to the left shoulder and down the internal portion of the left arm to the fingers, generally to the last two. Occasionally the pain may radiate to the left side of the neck, the angle of the jaw, and even to the top of the head. Great tenderness persists quite a time after the attacks.

(3) The patient must stop and remain immobile during the attacks.

(4) During the attacks there is a great fear and anxiety even in the most apathetic individual.

The predisposing cause of the attacks are ususally some form of exertion or excitement or emotion, exposure to cold, or to the wind, or from gastric distention, either gaseous or after a heavy meal. Angina pectoris of effort is always very serious. Sudden death occurs from angina pectoris usually by ventricular fibrillation, or arrest of the heart's action by vagal excitation.

There is a type of angina pectoris which is as a rule benign, and rarely if ever ends

fatally. It occurs in the neurotics, persons who are very emotional and highly excitable, and who have all the hysterical stigmata, especially pronounced vaso-motor disturbances. Their palpable arteries are contracted, the blood pressure is as a rule low, and they are subject to spastic contractions of all their hollow organs. The angina pectoris is doubtless provoked by a spasm of the coronary arteries, causing an ischemia of the heart muscle. The history and the nervous and mental make up of the patient is often sufficient for the making of a correct differential diagnosis. The heart, aorta and coronary arteries are not diseased, the attacks are caused by an abnormally irritable and sensitive cardio-nervous system.

Coronary thrombosis and embolism are the most redoubtable complications as well as the most frequent causes of sudden death in persons with heart disease. The severity of these attacks depends upon the extent of the infarction caused by thrombi and emboli. Large acute infarctions result either in a rapid death or in a cardiac aneurysm. Successive small foci of softening, progressively disintegrate the myocardium with resulting left ventricular insufficiency. These infarcts are of the embolic type.

The symptoms are not characteristic of typical angina pectoris; the character of the pains and their localization are different, they are usually lodged in the lower sternal region or in the epigastrium. There is a profound and immediate shock, the extremities become cold, and the patient is bathed in cold perspiration, the respiration is shallow, there is a rapid and decided drop in the systolic blood pressure, and pericardial friction sounds can be heard in a few hours after the onset of the attack. Frequently gallop rhythm is noticeable, and pulmonary edema is a common cause of death in these cases.

The friction sounds are caused by the inflammation of the pericardium overlying the area of the infarction.

Thrombostasis is characterized by the sudden appearance of violent dyspnea with cyanosis and passive congestion of the lungs, increase of the size of the heart due to aneurysmal dilatation of the infarcted area, high leukocytic count and the electrocardiographic findings.

Aneurysms of the aorta cause sometimes severe thoracic pains, but as a rule they are not anginiform. They are constant, lancinating and boring in character, and may occasionally be increased by exercise. Their location is limited to a particular spot of the chest. Their differential diagnosis presents no difficulty.

It has already been mentioned that aortic and cardiac dilatation may produce pain, anginal in character, caused by the distention of these organs. Dilatation of the left auricle often cause anginal pains by pressing upon the aorta at its inception.

Tessier and Dupasquier have described a syndrome of painful dyspnea, anginiform in character, in chronic pulmonary conditions with venous dilatation. They attribute the pain to a compression of the cardiac plexus by a dilated right branch of the pulmonary artery.

Hypertension may occasionally cause anginal pains. It is a fact that the stimulation of the central end of the depressor nerve results in two most important functions; one, a vaso-dilatation of the abdominal vessels, and the other, a slowing of the heart rhythm. The duty of the depressor nerve is to protect the heart against excessive blood pressure. As the hyperten-

sion which by increasing the intra-aortic and intra-cardiac pressure causes an irritation of the terminal fibres of the depressor nerve, through its reflex action it diminishes blood pressure, whilst at the same time through vagal influence the heart action is slowed. This function is important to note, because the anigna pectoris caused by hypertension may be said to be protective to the heart, for by increasing the reservoir for blood (by vaso-dilatation of the abdominal vessels) the pressure must fall. This is a fact that the surgeon should seriously consider before operating for angina pectoris.

Acute pericarditis gives thoracic pains, which by the extent of their violence, and by cervical and brachial radiations, may effect an anginal character. The diagnosis is plain, but in all cases of acute pericarditis the possibility of coronary infarcts should be remembered.

Lyon is strongly of the opinion that angina of a reflex origin exists, which originates from gall stones, gaseous distention of the stomach and of the left bend of the colon.

All acute affections of the lungs and pleura, malignancy of the lower end of the esophagus, mediastinal and spinal tumors, Potts disease, all occasionally give pains similar in character to those of angina pectoris.

In the past few years cases of angina pectoris resulting from pernicious anemia have been reported.

Neuralgias, local in their scope, have been mistaken for angina pectoris, especially left sided cervico-brachial and thoraco brachial neuralgias. Their pains are not produced by effort and are not associated with cardiac abnormalities.

Intercoastal neuralgia because of its severe thoracic pains, and occasional causation of the sensation of compression of the chest, gives so similar a picture of angina pectoris as to make a differential diagnosis sometimes extremely difficult, especially at the onset of the attack.

Cramps of the intercostal muscles give paroxysms of thoracic pains. The myalgias, and rheumatism, of these muscles and pleurodynias have been sources of diagnostic errors.

SUMMARY.

Angina pectoris is a syndrome. The real underlying cause for the attacks is unknown; that such a cause exists is a certainty. But we know that certain pathological conditions of the heart and aorta predispose to these attacks, the most frequently found in autopsies are an aortitis, especially or the ascending aorta, or a disease or degeneration of the coronary arteries, the most frequent causes of angian of effort. The angina pectoris of the decubitus is usually of myocardial origin. I have usually found it in cases of cardiac decompensation and dilated hearts. It seems that the angina of effort frequently terminates in the angina of the decubitus. Weckenbach said that cardiac insufficiency is antagonistic to angina, the first giving way to the second.

This dreadful disease is increasing rapidly, it attacks mostly the well-to-do men, the brain worker, it is a malady more frequently encountered in private practice than in the wards and clinics of charity hospitals.

Whilst every case having thoracic pains or some disturbing sub-sternal sensation must be given careful consideration, yet, all chronic pains are not due to angina pectoris, and all angina pectoris is not deadly.

THE MECHANISM OF THE PRODUCTION OF THORACIC DISTRESS.*

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A rational understanding of the why and how, the pathologic physiology of a disease process is the first step necessary in the alleviation of the disturbance. A clear visualization of the modus operandi, even though it is based in part on theoretical assumption is essential in differential diagnosis and for rational therapeutic endeavors. Few conditions command greater respect or require more meticulous care, diagnostic acumen, and psychologic insight in their elucidation than do complaints of distress in the chest. A diagnosis of angina pectoris is of grave significance not only to the neurotic, temperamental intellectual, but even to the stolid, stoic fatalist. The awesome traditional designation strikes fear with its demoralizing influence into even the heroic soul. The natural bent toward the spasmodic type of reaction is exaggerated by being repeatedly precipitated.

The psychic factors and influences play a great part in the removal of central inhibition and the loosening of the reins of the vegetative nervous system. That there is a constitutional susceptibility to such abnormal reactions as are produced by an imbalance of the sympathetic nervous system is more or less generally conceded. Dr. W. R. Houston of Augusta, Ga. in a recent brilliant philosophical discourse illuminated this important subject anew with many keen observations and clever deductions. He called attention again to the frequency of the spasmogenic aptitude that reacts so distressingly to chronic fatigue and to disturbances in emotional life in Americans as contrasted with the Chinese. This is attributed to the Occidental's psychological tendency to protest and to attempt to remove every difficulty in the environment, an external adjustment, rather than to make, as the Oriental does, an internal adjustment, accepting every situation as inevitable. Something of the same tendency is probably the reason for the relative infrequency of the classical picture in the negro, a fact called to my attention by Dr. I. I. Lemann.

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PATHWAYS OF PAIN PERCEPTION.

Sensitivity to stimuli is in general a protective mechanism. The disturbing stimuli coming into consciousness produce a variety of sensations such as burning, pressing, constricting, strangling, gnawing, or cutting, which are all interpreted as distress or pain. Pain is the commonest symptom par excellence of a morbid process in any part of the body, not of necessity in the region in which the sensation is perceived. The conception of referred pain and of the intricacies of the specialized system for pain perception is important for diagnosis. Not all sensory end organs and nerves, when stimulated, register pain. Temperature, pressure, motion, and position are also recorded by the sensory system. Somatic sensory impulses are brought to the spinal cord through the spinal ganglia and the posterior nerve roots at the regular segmental levels. Visceral sensory impulses are conveyed by the sympathetic nervous system to the sympathetic trunk and ganglia and thence through the white rami to the spinal cord in certain segmental areas.

In the spinal cord the sensations of pain are conducted from the dorsal horn, where there is association with vasomotor and trophic function, across and by centripetal fibres of the second order in the opposite lateral column by way of the spinothalamic tract, ascending to the thalamus. This great basal nucleus is thought to act as the great connecting station through which practically the whole of the sensory tracts must pass before diverging to the cortical

sensory areas. In the cortex the impulses pass from subconsciousness to consciousness for interpretation of sensation.

Many authorities consider the thalamus the center of pain perception. It is apparently also intimately concerned in certain emotional psycho-reflexes and responses. Exceedingly severe and continuous central pains referred to the contralateral half of the body with a persistent crossed hemianesthesia, as well as involuntary laughter or weeping, are symptoms of thalamic disease and give the clue to the functions described. It is thus quite possible to have a central pain, which may be entirely psychogenic, in high-strung, neurotic individuals.

The general picture and scheme thus completed gives us a broader view of pain perception. Somatic sensory and vegetative viscero-sensory stimuli originating certainly as low as the diaphragm and perhaps also from or as low as the upper abdominal zone may give rise to referred thoracic pain or distress. The well known general tendency to spastic contractions of all hollow organs and tubes in individuals with the spasmogenic aptitude would account for the occurrence of concomitant visceral spasms in widely separated and neurologically unconnected localized areas.

SPECIFIC CARDIOTHORACIC NERVOUS CONNECTIONS AND ZONES.

The nerve supply to the heart is an intricate meshwork derived from the autonomic and the sympathetic systems. Plexuses of non-medullated nerve fibers and ganglion cells spread over the roots of the pulmonary artery and the aorta spreading down along the coronary arteries and their branches just beneath the epicardium. There are fibers from the vagus and recurrent laryngeal nerves and from the superior, middle, and inferior cardiac nerves. These latter originate in the cervical sympathetic chain and ganglia, as well as in the stellate and first thoracic sympathetic ganglia to which structures great numbers of white rami pass.

THE OVERFLOW OF NERVOUS IMPULSES.

In man, impulses are apparently conveyed to the heart and to the brain directly by the vagus nerves and their intimately associated depressor nerves. Through the terminals of these paths in the region of the floor of the fourth ventricle, there may be overflow stimulation of the medullary centers producing the vaso-motor (pallor, sweats), secretory (salivation, diuresis) and reflex gastrointestinal functional disturbances.

Spread to the spinal cord is further accomplished through the gray and white rami of the cervical sympathetic ganglia, by the stellate and inferior to the seventh and eighth cervical segments; by the middle to the fifth and sixth cervical segments; and to and by the superior cervical sympathetic ganglion to the first to the fourth cervical segments from which originate the great occipital and the spinal accessory nerves.

The hypoglossal and glossopharyngeal stimulation by overflow may give the throat gripping sensation, while spread to the trigeminal, or the gasserian ganglion, may produce the pain that is sometimes felt in the jaw. There is also connection with the first to, and possibly including, the fourth thoracic sympathetic ganglia. The vasomotor fibers have been shown to accompany the cardio-thoracic nerves.

Head's figures show the first, second, and third dorsal segments as the cardiac zone, but clinical experiences give a much wider zone. This is presumably the result of stimulus overflow spreading up and down the cord with consequent painful sensations in the neck and chest and occasionally into the abdomen. Usually the pain distribution coincides with that of the seventh and eighth cervicals and the first, second, third, and fourth dorsal segments occasionally going as high as the upper cervicals and as low as the sixth dorsal segment.

The first dorsal segment supplies the inner aspect of the forearm from the elbow to below the wrist and together with the

third the sternomanubrial junction is supplied. The second segment is distributed, laterally to the first and third, to the inner aspect of the arm to the elbow, and to the axilla. The third on the arm spreads out anteriorly to the second. These three segments bear the brunt of the cardiac pain traffic, but usually the adjacent segments are somewhat excited.

The first and second dorsal segments are distributed to the jaw and neck while the fourth thoracic supplies a band around the chest just above the nipple in the apex of the axilla and over the scapula posteriorly. The fifth covers the zone over the breast and the angle of scapula; the sixth, the inframammary, xiphoid, and tip of the scapular zone; the seventh, the upper epigastric angle; the eighth, the lower epigastrium, stomach and liver regions; the ninth, the pyloric, duodenal and gall-bladder areas; and the tenth segment is distributed to the band of the umbilical region, encircling the trunk, embracing the base of the axilla and of the chest.

THE PAIN STIMULUS IN THE HEART.

It is in the explanation of the mode of origin in the heart of great vessels and the type of stimulus which produces cardiothoracic distress that opinions differ so much. The pathological changes vary widely in degree and in structures involved. The post-mortem changes are often seen in individuals who during life had no distress. The nervous make-up of the subject is apparently quite as important as is his cardiovascular pathology. Herein, therefore, lie the causes of the multiplicity of theories of the mechanism of cardiothoracic pain production. The stimulus may be physical or chemical. The general tendency has been to try to rationalize mechanical changes that would produce irritation of the nerve endings to the heart. The workings of such an explanation is more easily visualized.

The conception of occasional spasmodic contractions of the coronary arterioles is still most plausible. Comparable abnormal states can occasionally be observed directly in the retinal arteries in individuals who are having frequent cerebral episodes. If the retinal arteries contract spasmodically at times, it is quite likely that other arteries will do the same under a similar stimulus. Arterioles and capillary networks in the skin have also been shown to become spastic as a result of a fall in the peripheral blood pressure and blood flow. Large normal arteries, with or without sclerosis and clacification cannot be expected to react in this way, much less so abnormal arteries. To account for the frequency of attacks in the face of such facts necessitates recalling the fact that probably only the smaller vessels, the arterioles, react significantly to vasomotor influence. Some pathologic changes in the major coronary branches or their orifices or in the aortic wall are practically always present. It is conceivable that the coronary circulation is chronically kept at a critical threshold by these pathologic arterial changes without or with the detrimental effects of a low diastolic blood pressure of aortic regurgitation and any infinitesimally small additional reduction suffices to overthrow a delicate physicochemical balance and precipitate an angiospasm and an attack of pain.

This latter upset is not of pain so easily visualized. The decrease in the coronary circulation produces an ischemia of the heart muscle with a curtailment of the vital oxygen supply as well as the general nutrition. This might conceivably result in a slight dilatation of the heart and a concomitant stretching of the coronary branches, which are accompanied by sensory nerves.

The distention of a coronary artery behind the spasm proximally may cause the pain inasmuch as the arterial wall is well supplied with nerves. In the aortic theory of the original of anginal pain, dilatation of the great vessels with stretching and stimulation of its nerves and the contained

Pacinian or Vaterian sensory end organs, is the explanation usually offered.

The sudden traumatization of the pathological artery wall in response to nervous or mechanical stimulation with the production of obstruction by loosened or expanded atheromatous material in the vessel wall has no substantiating evidence. A large proportion of patients dying in status anginosus present damaged coronary vesvels which if carefully dissected will show occluding thromboses. These conditions may, however, obtain without there having been a previous history of a painful seizure. The rate of development of the obstruction may be the factor that determines when there will or will not be pain.

How the ischemia* may give rise to pain is difficult to rationalize. We know very little about chemical stimulation of sensory nerve endings. It seems hardly conceivable that the ischemia of the heart muscle in itself could give rise to the stimulus.

No really analogous conditions suggest themselves. The lactic acid coagulation explanation of painful, stiff muscles the day following physical effort is certainly not applicable to the explanation of the sudden attacks of cardiac pain associated with emotion, eating, or exertion. In the pain of ischemia cordis intermittens of coronary sclerosis or in the explanation of chronic fatigue ache there may be more theoretical basis for this hypothesis.

Blood deficiency anemia and methemoglobinemia may result in myocardial exhaustion as may also undernutrition, avitaminosis, infection, and sudden overexertion. Chronic overburdening of the heart by chronic hypertension, valvular lesions, parietal pericardial adhesions, sinus tachycardia of hyperthyroidism, prolonged paroxysms of tachycardia, flutter, fibrillation, excessive vagatonic slowing, and heart block may produce cardiac fatigue.

*This conception of ischemia has recently been re-emphasized and offered as a new theory expressing the state of the heart muscle as anoxemic rather than ischemic and attributing the manifestations of this state as others had to ischemia.

THE MORE APPARENT AND BENIGN TYPES OF THORACIC PAIN.

That there are benign types of distress in the chest, many of an extracardiac nature, is a fact that requires repeated and convincing reiteration. The manner of origin of these disturbances is quite as essential and for the most part less complex than that of the more malignant ones. A clear conception of the mechanism of these disorders is necessary for the further elucidation of the subject. Therefore, even at the risk of seemingly unnecessary recapitulation, I will discuss briefly again one of the more or less innocuous causes of thoracic distress.

PAIN FROM LOCAL DISEASE IN THE CHEST WALL.

Lesions of the bones, soft tissues, or muscles, as well as the nerves themselves, of the cervical spine, left shoulder girdle and arm, the thoracic cage and its lining membranes, and the pleura, such as result from trauma, pyogenic infection, arthritis, tuberculosis, syphilis, malignancy, or scar tissue may cause pain by direct involvement of sensory nerve end organs, nerve trunks, or posterior root ganglia producing neuralgia or myalgia pectoralis. These faces are well known and the mode of production of the symptom is obvious and there is rarely any difficulty in establishing the diagnosis once the condition is suspected and considered. The only reason for mentioning them is to recall them in connection with the broader aspect of the subject. It is to be remembered tht proliferative arthritis or Pott's disease or other destructive lesions of the cervical vertebrae, cervical rib, or eroding aneurysms may cause upper thoracic pain by direct mechanical pressure irritation of the sensory nerves.

Intercostal neuralgia, neuritis, herpes zoster, the tabetic girdle sensation, or sharp crises are the painful responses of indirect internal, or endogenous irritation of the nerves, ganglia, or posterior roots. Acute pleurisy may cause pain in any part of the

chest. The pain is usually just over the area of pleural irritation and consequently the characteristic friction rub is usually easily discovered and may be considered confirmatory of the diagnosis in the absence of other signs of cardiovascular disturbance. Acute pericarditis involving the apical and diaphragmatic areas where the nerve and consequently sensitive pleura is reflected over the pericardial sac, as described by Capps, of Chicago, will give rise to precordial pain. In those past the age of 40 years the pericarditis of a cardiac infarction following coronary thrombosis must be differentiated from a simple apical or diaphragmatic pericarditis with pain.

GASTROCARDIAC DISTRESS.

The very common precordial distress associated with gastric disturbance is in a large measure a mechanical phenomenon. The reflex may originate from the large cardiac end, sphincter and fundus of the greatly distended viscus. The flatulent organ pushing up the infracardiac dome of the diaphragm may mechanically force upward and backward the heart, twist it, and embarrass its action and its circulation. Sharp palpatory thrusts under the left costal margin aggravate an existing gastrocardiac distress while the free eructation of gas relieves the condition. The mechanical effects of gastrectasis may embarrass the circulation even in normal coronaries, but the effects are likely to be considerably more serious in the individual with diseased coronary vessels.

The hypersthenic habitus with a high, flat diaphragm, a protuberant abdomen with an omental fat mass and an increased intra-abdominal pressure are predisposing factors. This disturbance responds to reassurance along with the use of some discretion in the choice of diet. Flatulence producing vegetables, liquid foods, and wind-sucking (aerophagia) should be avoided. Potassium acid tartrate, 30 gram doses in hot water on arising or half an hour before meals, is often of value in controlling the excessive flatulence.

REFLEX PAIN IN THE DORSAL SEGMENTAL AREAS.

Segmental distribution of overflow impulses has been commented upon. The so-called reflex irritation comes into play and accounts for much thoracic distress. Lesions of the diaphragm may present, especially by way of the phrenic nerve, reflex pain distributed high in the chest and the neck. The phrenic nerve levels are chiefly the fourth cervical with some from the third and fifth cervical segment. Occasionally, subdiaphragmatic lesions, especially those originating in the gallbladder and the cardiac end of the stomach, rarely in the pylorus or lower organs, may give rise to intense enough stimulation that there will be an upward, segmental overflow to produce reflex upper thoracic pain. Discovery and alleviation of the primary disease process is usually followed by a subsidence of the reflex pain.

When the painful reflexes originate in the cardiac tissues, even though the precipitating factors are of temporary mechanical or toxic nature, the symptom is of more serious moment. It is true that the individual attacks are benign in themselves, but the frequent repetition of the episode may not be entirely innocuous, for under most circumstances the blood supply of the heart is definitely, though only slightly and temporarily, curtailed.

A toxic *nicotine* type of precordial distress of more or less benign character, which is worthy of further comment, is that occurring in tobacco smokers. Persons, often under stress, smoke tobacco incessantly, usually inhaling the smoke deeply. Under these circumstances and often in more susceptible individuals with less abuse of the weed, there occur attacks of cardiac distress. The paroxysms may simulate quite closely the classical picture. Nicotine may act upon the cardiosympathetic nervous system and influence unfavorably the coronary circulation. It may act as epinephrine does merely as an exciting factor in the presence of a latent process.

Patients with frank coronary disease are often very chronic, inveterate tobacco addicts, and many observers are of the opinion that there is some causal relationship. This is more likely to be true for individuals who have an inherited tendency to coronary disease, for others can apparently indulge to excess with impunity. The chief characteristic of the so-called nicotine angina is its preciptation only after inhaling tobacco smoke and its prompt subsidence following the abstinence from tobacco. In some individuals with coronary disease, the inhalation of tobacco smoke will cause the onset of an attack of pain. The evidences of increased vagus tone, the slow irregular sinus arrhythmia with or without ectopics or premature contractions, likewise promptly disappear after stopping the use of tobacco.

The *neurogenic* form of more or less benign precordial distress is described by individuals after an emotional upset, usually thin young females of a high-strung, neurotic temperament at puberty, in the presence of endocrine disturbances or at the menopause. The pain of the soldier's heart in the "effort syndrome" would come under this heading. The abnormal sensation varies from a heavy subcardiac ache to sharp, sudden, instantaneous precordial pains that momentarily transfix the thorax or radiate to the left axilla or left shoulder and sometimes even into the left arm. Ectopics or premature contractions of the heart are usually noted and will account for the sudden, sharp, darting, momentary pains and palpitation in these very sensitive individuals. The patient is usually erethistic, restless, and emotional, tossing about in bed insisting hysterically that her death is near. Irregular rhythms, tachycardia, palpitation, throbbing sensations, giddiness, and even vertigo are common symptoms which are, however, rarely present in one critically ill with the serious heart pain. The attacks are usually relieved by sedatives, as bromides and barbitals. On exertion the patient has a good exercise tolerance. Except for the mechanism disturbance, the cardiovascular system is entirely negative in this condition. It is, however, unfortunately also true that some cases of true anginal syndrome present very little abnormality on physical examination.

THE MORE OBSCURE AND SERIOUS TYPES OF THORACIC PAIN: MYOCARDIAL EXHAUSTION ACHE.

Pain, as a result of the adverse influences to be outlined presently, may prove afflictive to the sufferer but usually the course of the disease is a chronic one. Chronic overburdening of the heart by excessive physical strain or the maintenance of a chronic hypertension against a relentless peripheral arteriolar resistance with an occasional, sudden, sharp increase in the load exhausts the heart muscle. The pain is usually dull and aching, but may occasionally be sharp as a result of cumulative fatigue and sudden strain which may produce some dilitation. Vasodilators usually promptly relieve this distress. Venesection acts likewise and is often life saving in the presence of pulmonary edema.

Prolonged, sudden, and excessive disturbances of the cardiac mechanism, such as paroxysmal tachycardia, flutter, fibrillation or block, especially those with very high or very low rates or in individuals with some coronary arterial changes, may have sufficient embarrassment of the intramyocardial circulation that breast agony arises. Avitaminosis, undernutrition, methemoglobinemia, anoxemia or anemia may, in sensitive individuals without or in the presence of sclerosis of the coronary arteries, give rise to cardiac distress, presumably the result of myocardial exhaustion.

Chronic adhesive pericarditis binds down a heart and the constant tugging against the fixed anchorage exhausts the myocardium and this along with the frequently accompanying embarrassment of the coronary circulation by the adhesions gives rise to distress.

Certain chronic valvular diseases, especially aortic and the mitral stenosis and insufficiency, may be associated with dull or sharp, constant or paroxysmal cardiac pain. In aortic stenosis the chronic overload, the low pulse pressure, and in stenosis and insufficiency as well the frequently occurring changes in the coronary orifices (accompanying the valve lesion), all lower the circulation in the heart muscle. In mitral disease Sternberg found the fat pad about the circumflex coronary branch atrophied, presumably the result of pressure from the engorged left auricle. The wall of the vessel was also thinned, so much so that any sudden increase in intra-auricular pressure could obliterate the artery or narrow it considerably, thus interfering seriously with the coronary circulation. It must also be remembered that the common etiologic agent of the valve lesions, rheumatic fever, may have extensively involved and have left scars in and near the coronary arteries.

Sclerosed coronary arteries or narrowed coronary orifices apparently cannot dilate to allow the requisite threefold coronary circulation that the heart demands on exertion. Exercise thus produces the ischemia cordis intermittens with pain of Bischoff, which subsides with rest. Fatigue, anemia, ischemia, or anoxemia are present and probably some stretching of the cardiac structures occurs. Besides rest, vasodilators, especially of the xanthin group, notably theophylline ethylenediamin (metaphyllin, euphyllin), relieve the distress in a large degree. The drugs should be given in 0.1 to 0.2 gm. (1½ to 3 grains) doses every three or four hours. Complete solution of the preparation is a most essential detail and is often the deciding factor in the success or failure of the effectiveness of the drug. The latter drugs, used regularly daily, apparently ward off attacks by keeping the coronaries more or less dilated, thus increasing the circulation to the heart itself and raising, so to speak, its tolerance or threshold.

CORONARY THOMBOSIS AND CARDIAC INFRACTION

Organic obstruction of the blood flow through a major branch of the coronary artery precipitates a clinical picture that is frequently difficult to differentiate from the spasmodic syndrome of angina pectoris. The individual prone to this sudden catastrophe has usually had few if any symptoms of heart disease. Slight breathlessness and slight distress may or may not have been previously felt after a considerable effort. The victim is not infrequently convalescing from a respiratory infection of the influenzal type, or has an infectious focus that is or is not being treated.

Acute circulatory collapse may come on rapidly and be the outstanding symptom complex. An ashen gray sallowness, a saturnine pallor to actual cyanosis is present. Usually, however, a terrific agonizing pain predominates the picture. This pain differs from that of the classical syndrome chiefly in its persistence for hours and sometimes for days and weeks during which it is constantly present, but sometimes it presents waves of increased sharpness. Vasodilators, which act so dramatically in spasmodic pain, fail to relieve the pain of coronary obstruction. Morphin or pantopon in 30 mg. or ½ grain doses is usually required to give any relief. Absolute rest during this critical period is of paramount importance and should be secured as completely as possible. Measures to prevent the advance of the thrombosis or secondary thromboses are still only in the experimental stage. The classical status anginosus is almost exactly reproduced. In the true status anginosus there are, however, usually brief intervals of relief, and vasodilators are effective, but not so in that state in coronary occlusion.

The patient apparently soon learns that no fixed position, no tenseness of muscles does any good, and sometimes, not even exertion and eating affect the pain. Ex-

treme weakness, however, often strikes the patient down and makes him unable to move about. The power of speech may fail him. The pulse is usually very rapid or very slow and is often irregular and often barely perceptible. The blood pressure usually falls precipitously to dangerously low levels of 60 to 80 mm. of mercury. The heart sounds become very faint and muffled, and a pericardial friction rub may appear promptly or after several hours to a day. Within thirty-six hours a slight fever and a leukocytosis are present as a result of absorption of products of the necrosing infarcted myocardium. Electrocardiographic tracings show significant ST interval and T wave changes in a large proportion, perhaps 75 per cent of cases, but unfortunately not in all cases.

Disproportionate dyspnea, pulmonary edema with congestion and hemoptysis, cyanosis, vomiting, and hiccough are much more common after coronary thrombosis than in classical paroxysmal cardiac pain. The cardiac infarction pain is also much more likely to be in the epigastrium and associated with other abdominal reflex states. The liver is more likely to be engorged after cardiac infarction, and further evidences of myocardial insufficiency as congestion and edema appear more rapidly. Death may come in or at a shorter or longer interval after the first breast pang.

The attack may subside, and with rest in bed the patient may recover. It is not uncommon after such a recovery to find that the patient is subject to cardiac pain on exertion. In this post-coronary thrombosis condition I have felt that persistent vasodilators, such as theophyllin ethylenediamin or theocin, which increase the coronary circulation, aid greatly in the reparative processes and increase the exercise tolerance and preclude the secondary attacks.

ANGINA PECTORIS.

The term "angina pectoris" has been retained for the traditional, dramatic type of spasmodic heart pain attack. The classical picture will bear detailed consideration, for entirely satisfactory clinical differentiation of the morbid state present or the abnormal physiology responsible for cardiac pain is at present not always possible.

The earlier, milder attacks or this symptom-complex are usually ignored or mistaken for disturbance in other organs, especially the stomach. The retrosternal position of the abnormal sensation is its chief characteristic and this along with a consideration of the provoking factors and the relieving factors may give the clue. The abnormal sensation may be merely a heaviness or a burning that may simulate closely a pyrosis. The absence of physical signs of aortic or cardiac disease makes the diagnosis little more than a guess under these circumstances.

The typical paroxysmal, spasmodic attack of angina pectoris strikes precipitously and paroxysmally, transforming an apparently healthy, active individual into an immobile statuesque figure. The victim suffers an excruciating, burning, vise-like, crushing squeezing, tearing, strangling, constricting, choking or oppressing pressure, heavy weight sensation, or a violent substernal pain at the level of the upper and middle third of the sternum. The alarming suddenness, the sense of imminent dissolution with the clear, intellectual faculties give rise to an indescribable anguish and anxiety. The distress seems unbearable, and the few *minutes* during the attack pass like hours.

Palpitation of the heart and a momentary sensation of suspended respiration may be felt, as may also episgastric fullness and nausea. The pain most characteristically radiates to the left shoulder and down the inside of the left arm. It may transfix the left chest to the left back; it may pass to the right arm or into the neck, giving the sensation of strangulation, to the jaw on one or both sides, or to the face, or even to the top of the head. The pain in the secondary area may begin immediately or lag

behind and may be spread over a wide area or be localized to the wrist, elbow, or inner upper arm. It may be sharp or it may be dull and aching—merely a heavy feeling associated with numbness and tingling. Soreness may remain for hours. Repeated attacks in close succession produce a status anginosus.

Accompanying vasomoter disturbances in the attack cause the patient's face to grow ashen pale, beads of perspiration to appear on his forehead, and his body to become clammy with perspiration and his extremities cold. He usually holds himself rigid in his steps with his hand over his heart. The respiration is seemingly unaltered; there is usually no dyspnea, though the breath is shallow or constrained because of distress. Eructations of gas and profuse micturition of pale urine may come at the end of an attack. The pulse and heart action are usually regular and not at all affected though a slight rise in rate often occurs. The heart is usually at the upper limit of normal in size and only occasionally is it enlarged. The aortic dullness may or may not be slightly increased. An aortic systolic murmur and an accentuated aortic second sound in the presence of a normal or low blood presure are significant findings. The blood pressure frequently, but not invariably, shows a rise during an attack; occasionally, it remains unchanged and sometimes there is a sharp fall. The electrocardiogram frequently records changed or inverted T waves and shifted ST intervals during an attack.

The dramatic relief afforded these patients by the use of nitrites or alcoholic preparations along with rest is characteristic, and the attack is always aborted by the specific drugs. The precipitating factors are emotion, anger, worry or fright, eating, overdistention, flatulence, exertion, and cold drafts. Bromides in full therapeutic doses will often break a succession of attacks by dulling the sensory reception of provocative stimuli and will reduce greatly the frequency of attacks when taken regularly in 1 gram (15 grains) doses. Soporifics, as chloral hydrate in 1 gram (15 grains) doses at night or 0.3 gram (5 grains) doses at intervals are especially effective in quieting nervous, hypertensive individuals. Antispasmotics, as atropin in 0.5 mg. (1/100 grain) doses or, better still, homatropin brommethylate in doses up to 25 mg. (½ grain), are often distinctly valuable in preventing and averting attacks. Vasodilators with persisting action, such as potassium iodide in 1 to 2 gram (30 to 60 grains) doses, erythrol tetranitrate in 60 mg. (¾ grain) doses, and theophyllin ethylenediamin theocin or 0.1 to 0.2 gram (1½ to 3 grains) every four hours are of value.

SURGICAL INTERVENTION FOR THE RELIEF OF ATTACKS OF CARDIAC PAIN.

It is only after the attempt to find out the irritative precipitating factor and removal of it is unsuccessful, and rigid application of a therapeutic regime has failed that the radical surgical measures are to be considered. Once the decision has been made, the operative procedure of choice depends in a large measure upon the condition of the patient. Cutler's statistics seem to indicate that extensive ablations of the entire cervical sympathetic chain including the first thoracic ganglion on the left and then on the right side offers the greatest hope of lasting relief. This extensive and radical procedure has afforded relief even in the advanced severe types of the disorder. A complete unilateral procedure has been well borne even by patients of the most serious type of the disturbance. However, it is preferable to have the patients upon whom such operations are contemplated measure up to the ideal requirements as good surgical risks. Relatively few patients with heart disease can even approximate such physical standards.

Furthermore, the success that has attended the operation of partial sympathectomy of Coffey with the removal of the superior and middle ganglia only with or without division of the superior cardiac nerve and that of sectioning confined to the

rami communicantes, as practiced by Leriche, to the stellate ganglion as the complete operation or as the first stage to a subsequent more complete sympathectomy have been shown to make the extensive and serious ablation unnecessary.

The procedure of Coffey has been most popular in this country. Partial sympathectomy limited to the middle and inferior cervical or to the stellate ganglion have been practiced. Leriche and Fontaine have advocated the division of only the rami communicantes of the stellate ganglion as the most desirable procedure. The majority of the cardiosensory fibers to the spinal cord are said to pass by this route. The sympathetic trunk above the stellate ganglion is usually also cut. The continuity of the cerebral nerve is thus interrupted and the depressor fibers, when identified, are severed. The partial procedures are apparently simple and can be accomplished with little or no coma, general anesthesia, shock, or danger to the patients and can be applied in cases where grave cardiac failure would contraindicate any other operation.

Patients with cardiac pain that have been subjected to operative procedure and whom I have had the privilege of following up have in general fared well. Two of the patients were women with definite cardiac infarction and more or less constant, agonizing status anginosus. In both of these, in spite of contra-indications, partial sympathectomy was done as a humanitarian measure to relieve the intense suffering. In both instances the sharpness of the pain was removed. There were still attacks of a peculiar feeling in the chest, suggesting an abortive seizure and serving at the same time as a warning. One patient lived but two years during which time she was relatively free from agony. The other patient had a very stormy postoperative course, finally presenting embolism of the extremity which had to be amputated due to gangrene. She was relieved to a large extent and lived three years in comparative comfort. One other patient was slightly relieved, one was not relieved at all except perhaps some of the sharpness of the pain was relieved.

In the face of these facts, however, any one who has seen the dramatic results that sometimes follow operations cannot help but be enthusiastic and feel that in the resistant sufferer, operative procedure offers something for the otherwise hopeless case. It is true that death may come and does come in a small percentage of the cases during the operation, but ultimately and usually within a period of a few months to a few years a fatal attack is suffered. Others may live a few weeks or a few months or even a few years, and even a short interval of freedom from pain is suffiicient to justify the operation.

SUMMARY AND CONCLUSIONS.

One might consider the recognition of the mechanism at fault in a given case of thoracic distress as constituting the diagnosis and prognosis, and at the same time as more or less outlining the therapy.

It is interesting, as well as advantageous, to think in these terms and furthermore, it is so much easier to grasp and hold the principles of the pathological physiology involved than to try to remember empirical dogma.

The decreased coronary circulation theories of the origin of cardiac pain have most support. The susceptibility of the nervous system of the given individual is quite essential. The spasmogenic aptitude is common in our age and in our land.

Coronary thrombosis is probaly the usual complication in all fatal cases of breast pang. In the malignant spasmodic type of thoracic pain death may come—and does come—sometimes in true anginal attack even when the patient is under expert care.

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DISCUSSION

D. I. I. Lemann (New Orleans): You have heard a masterly and exhaustive discussion of all that is known with regard to the pathology and the pathological physiology underlying these various forms of thoracic pain, particularly of heart pain.

I wish to address my remarks entirely to the clinical implications of this exposition, and I wish to reinforce what has been said by both the essayists as to some of the difficulties presented to the clinician in the interpretation of the various types of pain of the chest.

In the first place, I think we should all be impressed by the lack of correlation between the intensity of the pain and the seriousness of the condition underlying the pain. We may have very great pain in the patient and apparently very little seriousness, and we may have, on the other hand, comparatively little pain and very great seriousness. As to the latter, which of course is the more important of the two, I recall at least two patients in whom the diagnosis of coronary occlusion could be made without there having been much, or at least very agonizing, pain.

A man of about forty was taken with some discomfort after his evening meal and applied to a drug store for some remedy. He continued to have the pain that night and the next day. The next afternoon, nearly twenty-four hours after his pain had started, he came to Touro Infirmary where he was seen by the chief resident who could find nothing on physical examination, and prescribed a sedative. The man continued to have pain the second night and came back to the Touro Infirmary the third morning. When I saw him he did not object to being put off until the afternoon; his pain wasn't that agonizing. When I saw him in the afternoon he was apparently in no great pain or discomfort.

Within the next twenty-four hours, this man, whose picture I have just painted, developed a little fever, a leukocytosis, a pericardial rub, and a few rales at the base of one of his lungs. The electrocardiogram showed a typical inverted T wave in all three leads.

After this man was in the hospital a week, it was very difficult to convince him that he had ever been seriously sick.

I submit that here was a case of a very serious heart accident, who had such pain as might have been passed off; in fact he did pass it off for more than forty-eight hours as being nothing particularly serious.

I wish to emphasize, too, that in these coronary accidents there often is lacking the classical picture of heaviness, the lack of immobility, the lack of fear of impending death. On the contrary, I have seen a man actually moribund from coronary occlusion, who had such a great deal of pain as to become maniacal, and so excited that it took three people to hold him down in bed and who, in spite of attempts to restrain him, got up and walked around the room to within two or three hours of his death.

Another man, who had lost both of his lower limbs through Buerger's disease, and had a terminal coronary occlusion which I attributed to a central Buerger, had so much strength in the end that he was able to lift himself from the bed-pan, raising himself on his arms without any support from his legs.

Then I wish to refer briefly to the very great difficulty of the differential diagnosis between the pain of heart disease, of angina, if you will, or of coronary occlusion, and the pain of gall-bladder disease, and to remark that there are patients who may have both.

I recall one patient of whose illness I had read in the Journals, a well-known public man who was operated on in a well-known clinic for gall stones which were removed and who in his convalescence died of an angina attack.

Finally, I wish to refer to the very great difficulty in the minds of all workers in this field of differentiating between the classical picture of angina, and that which we have now come to recognize as definite coronary occlusion; a matter that becomes all the more important when one con-

siders the concluding sentences of Dr. Herrmann's paper when he discussed the advisability of surgical intervention.

If we can look upon a patient as having only a Heberden angina without definite anatomical disease in his heart muscle, or in his coronary arteries, we may plan for surgical intervention with some degree of complacency. If, however, we find difficulty in reconciling ourselves to such an idea of a patient having such attacks without definite anatomical disease, we shall want to interfere surgically very seldom.

The more I have seen these patients, and the more I analyze my own cases, the more reluctant I have become to make a diagnosis of angina pectoris without serious heart damage. In fact, I will say now I know of no patient in my own series where I would have been willing to say that the patient had no anatomical disease of the muscle or of the coronary artery. This attitude, then, explains why no sympathectomy has been done in New Orleans. Evidently the other clinicians have had the same experience.

Dr. E. W. A. Ochsner (New Orleans): If a mere surgeon may be allowed to speak before the Medical Section, I should like to say a few words with regard to the sympathectomy in angina pectoris.

I had the good fortune to work with Professor Schmieden in Frankfurt am Main, Germany, when he operated upon eighteen cases of angina pectoris. At that time indications for sympathectomy were not as striking as they are at the present time. I can recall two or three cases of definite syphilitic heart diseases which were operated upon, and one case of arteriosclerotic heart disease. In all of these cases there was no operative mortality. I think the procedure, if carried out correctly, is relatively without danger from an operative standpoint.

It is true that individuals with syphilitic heart diesase, or individuals with arteriosclerotic heart disease will receive relatively little benefit, but they will be relieved of their pain.

I agree with Dr. Lemann that if we feel sure the individual has a coronary occlusion, that the case is probably not suited for a sympathectomy. However, I believe it is possible (not being a cardiologist it is probably safe for me to make such a statement) to operate in the early case. I think if the operation is to be done, it should be done early before a great deal of myocardial damage is done.

Concerning the operative procedure which is indicated, our conclusions were that the complete Jonnesco operation, which consists of the removal of the first, second and third cervical sympathetic ganglia as well as the first thoracic, was the operation of choice. Any procedure short of this radical procedure gives only palliative results.

Coffey and Brown of this country advise removing the superior cervical sympathetic ganglion alone, believing that they in this way interrupt the motor fibers. We felt however, that if the operation is to be undertaken, a complete Jonnesco, including the removal of all three ganglia, is the operation of choice.

I should like to see some cases operated on. I think it is to be lamented that where this operative procedure has been done in over 300 instances, from a recent report by Brill, not one has ever been done in New Orleans where there is so much clinical material at Charity Hospital.

Dr. A. E. Fossier (closing): In answer to Dr. Ochsner, I didn't have a chance to go into that subject at all because there is so much to it; it is easier to write a book on that subject than it is to write an article in order to bring it within a fifteen minutes' talk.

The only time I was tempted to have an operation performed on my patient for an angina was a case that got well for quite a length of time and never had another attack. That experience has made be more or less very doubtful, but reading the statistics on the subject in the Journal very lately, and the results of many operators, they are simply overwhelmed with operations. Every surgeon has some choice procedure. Coffee and Brown even say there is no depressive nerve because it has been said when you cut a depressive nerve it couses a lot of trouble.

I am not in accord with it now; I want to know more. I am not a surgeon. I am not so enthusiastic about cutting when something else can be done. The rate of mortality there is about thirteen per cent. You are subjecting the man to a mortality of thirteen to fifteen per cent, with the chances of doing him any good about thirty-five to forty percent. That is my impression from the various authorities on the subject, so if a man has a chance of dying in thirteen out of 100, and you may only cure him thirty-five or forty times, I don't believe in subjecting him to that chance when we can do nearly as well in those cases with medical treatment.

As far as the angina decubitus, which is usually due to dilatation of the heart, these cases come at a stated hour, usually during the night. I have been called many a time. I have been able to ward off the attacks with a dose of atropin before the time the attack should take place. I have had quite a few of these. Atropin given at that time seems to have a beneficial effect in warding off

those attacks, whether you call them dilation, angina decubitus, or what you want to call them.

We don't know much about it. We know they are increasing with individuals. I think a great deal of it is due to lack of exercise, the indolence of people, and some of our doctors who are afraid to walk and who take an automobile to drive two blocks. There is a degeneration taking place in these heart muscles because they are not working hard enough to keep up. The laborer doesn't have trouble, but the people who do have trouble are those who sit down too much and drive automobiles most of the time when they ought to walk. There is something back of it. I have not been able to determine what it is, but it is increasing in those cases. They play golf once a week and sit down for a whole week, then when running for a car or on the golf links, down they drop and off they go and we read about it in the papers the very next day.

Dr. George Herrmann (Closing): I am fortunately still young enough to be quite radical in opinions and not be too severely criticized for those opinions. Therefore, I still believe there is abundant opportunity for surgical intervention in these cases. Certainly our knowledge of the sympathetic nervous system and the conduction paths from the heart has been greatly broadened by careful removal of certain parts of the cervical sympathetic system, and gradually we are learning something more about the pain conduction paths.

A pain is an important factor in this disease process. These patients die in pain, no matter who the medical man may be who is treating them. They all eventually die of pain. Almost all these cases have coronary thrombosis. May not repeated attacks of pain predispose to a more permanent occlusion? I have been able to dissect and have ina few instances been able to find coronary thrombosis in the smaller arteries.

Why do they die? Something in the attack cause the death. It is apparently associated—in the spasmodic type I am speaking of especially—with a spasm of the coronary arteries and perhaps in the medullary arteries. Any obliteration that may prevent the repetition of that spasm I think insures the patient longer life, or at least a happier life.

I believe the functional part of the disease is important. Spasm of the coronary may precipitate ventricular fibrillation, and the patient dies from the seizure due to the neurological stimulation that has been incurred. To find a patient with cardiac pain who has no organic changes is impossible, I believe. I think they all have organic changes, and I do not believe organic changes are a contradistinction to any method that may sever painful tracts.

The painful tracts may be separated even in the presence of pathological changes. I believe these patients are running on a certain level, a critical level, where any further insult of neurogenic origin will precipitate the attack. If you can remove that insult, that stimulus, you will save the patient from further attack. Even in the presence of definite coronary thrombosis, such as was present in the two cases reported recently which were observed several hundred miles away, these patients were relieved of status anginosus. I saw one patient in St. Louis who was in status anginosus for five and onehalf weeks, agony all the time, with acute exacerbations. We didn't know much about sympathectomy. Nobody wonted to undertake it at that time and the patient had to suffer the tortures of the dammed. I believe in that patient, at least, the injection of alcohol to block the painful paths would be a humane procedure even if the patient died in the operation. He is better off dead than enduring such pain which cannot be controlled with morphin or atropin.

DIAGNOSIS AND TREATMENT OF ACUTE AND CHRONIC ILEOCOLITIS IN INFANTS AND CHILDHOOD.*

JOE E. GREEN, M. D.,

RICHTON, MISS.

Due to the short time allotted for the discussion of this important subject which has caused all of us more worry than possibly any other disease, especially during the summer months, it will be impossible to do more than merely mention the major points as to diagnosis, differential diagnosis and symptoms, and devote more time to discussion of treatment. It is my desire in the discussion of this subject not to present a highly technical paper. I would not if I could. I could not if I would.

Reviewing the literature of fifty years ago, I find that authors of then and now give almost the same clinical findings but a great deal of laboratory work has been done which helps in making a correct diagnosis. However, one is forced to admit

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that after reading many of the text books that have been written telling of the microscopical and pathological findings, they usually wind up with the cheering statement, "It has not been definitely proven."

Our predecessors usually had about three classifications, viz: flux, bloody flux and, just before the baby died, looked sad and wise, then added that last classification, inflammation and congestion. This is a classification which some physicians still hide behind, when they are out in the country where they feel sure it will not get out, but usually we are greeted by some fellow coming in at a very inopportune time to ask "If it were really true that inflammation and congestion set in, and killed Little Willie."

CLASSIFICATION.

These are many, almost every author has one of his own, but I shall mention just a few selected from them all in discussing the acute type; viz: diarrhea, acute inflammatory diarrhea, acute ileocolitis and acute dysentery. These are synonimous terms and should be treated as such.

ETIOLOGY.

This disease is found more often during the summer months and occurs principally during the first and second years of life. It is also true that in the rural population where most of the cases are found, the colitis season opens principally with the coming of may haws and yellow plums and closes when raw potatoes and peanuts are gathered.

In breast fed babies, it is seldom found; therefore, the practice of weaning the baby during the first few months of life is nothing short of a tragedy and may God give us more physicians who will have enough interest in the under-privileged children to warn their mothers about what may happen if they wean their babies too soon. That is not the worst. How many of you have had mothers bring their babies in for treatment of colitis and when the question is asked as to whether the baby is breast fed, received an answer about as follows: "No, I weaned the baby two weeks ago, for Dr. A. milked a few drops of milk from my breast and said my milk was not agreeing with the baby and I must take it off the breast and give it Dime Brand condensed milk?"

Surely no man under the sound of my voice has been guilty of the "Attempt Baby Slaughter," for really that is what it means in many cases. Tell the mother that at least ninety-eight percent of them can nurse their babies and the quality of the milk is alright although the quantity may be lacking, which can be remedied by adding complimental artificial feeding.

Overloading the stomach with too much of the proper kind of food; or feeding the baby food that it cannot digest; or feeding milk that has been contaminated by careless and filthy handling; extreme heat and cold with undue exposure usually brought on from long trips during the hot summer or cold winter months, are also causes of diarrhea and colitis.

DIFFERENTIAL DIAGNOSIS.

There are many diseases which are easily overlooked when we are treating the various forms of intestinal toxemias so often grouped under ileocolitis. Typhoid fever sometimes is so similar in symptoms to colitis, that it is necessary to be on guard, but as a rule typhoid is more gradual in its onset, with the typical typhoid temperature curves, no blood until later and as a rule stools are less frequent. We must rely on the Widal reaction which may be obtained about the ninth day to make sure of our diagnosis. Appendicitis is another condition that at times is overlooked until too late for an operation that might have saved a life. However, in appendicitis, the onset is usually more acute, with a higher blood count and more pain.

DIAGNOSIS.

The physician often receives a hurry call to see a baby, who a few hours before was well, and is now having convulsions

which is almost always due to an overloaded stomach with food that the child cannot digest. It may be half ripe plums, peanuts, bananas, cabbage, in fact anything that is grown south of the Mason and Dixon line. The onset is sudden, temperature high, 103° to 106°, may or may not have vomiting, diarrhea, patient's face drawn, muscles may be rigid or completely relaxed, lies with eyes half closed and extremities often cold, body may be cold and clammy.

In another type of cases, the onset is more gradual beginning first with a mild intestinal indigestion, deranged bowel movement that contains some undigested matter; stools may be frequent or may not; fever gradually rises from day to day, child is cross and does not rest at night; appetite poor, and the stools that first were watery begin to show some mucus and blood which can be found microscopically from twenty-four to forty-eight hours before it can be seen in the stools. The blood, however, may be one of the first symptoms but usually shows up in from three to five days. The abdomen is distended, lips parched and often red, skin dry, eyes sunken and muscles relaxed, urine often shows traces of albumin and there is an increase in leukocytes.

The prognosis is good provided we begin the detoxication treatment early and support our patient by giving plenty of fluids and the proper kind of nourishment.

PROPHYLACTIC TREATMENT.

It is much easier to prevent than to cure, therefore, it is very important that the babies be kept on breast for at least six months, as breast fed babies seldom have colitis. In artificial fed infants, the milk should be boiled and precaution taken to prevent contamination by careless handling of the food. Thorough sterilization of bottles and nipples are very essential.

It is also true that many cases of colitis are caused by giving purgation to correct some mild intestinal disturbance, a practice that has in my mind caused more deaths than any other condition that arises from this disease, and one that cannot be condemned in too strong terms. The sooner we as medical men come to realize and accept the proven fact that ileocolitis is not a condition that must be combatted with drugs, the better it will be for the lives of the infants who fall into our hands for treatment. The baby's general condition must be watched and kept up to standard for it is the under-nourished children that usually fall victims to colitis.

There is a class of cases that call for both prophylactic and active treatment. These are the cases that all physicians meet almost every week of life. About the first symptoms are convulsions, which are (as has already been stated) almost always due to an overloaded stomach with food that the baby cannot digest; and I have learned not to believe what the mother or nurse has to say about the child having had nothing to eat. The proper prophylactic treatment in many instances will prevent a severe case of colitis and I like to call it prophylactic treatment, which is as follows: relieve the convulsion by giving hot mustard bath and keeping cold pack to head until patient relaxes, then unload the stomach by giving an emetic or using a stomach pump. I must repeat that many times the parents will insist that the baby has not had one thing to eat that it should not have had, but while they talk give the child a good big dose of syrup of ipecac; in just a few moment you will almost without exception prove to the distracted parent one or two things; either they are entirely ignorant of what the child has been eating or else they are just common liars, because when the child begins vomiting, you can usually point out green plums, half-ripe bananas, green fruit of all description, peanuts, turnip greens and almost anything found in the average grocery store.

After this is done, I make it a routine practice to give the patient a high enema of either normal saline or alkaline solution,

then you have about done all possible to prevent a severe ileocolitis except do not give them the old treatment of calomel and castor oil to sweep them out, for if you do, you will succeed in sweeping many of them into the grave yard.

The treatment of this disease has changed a great deal during the past few years from that of medication and starvation to feeding and watering. Maybe you do not like the term watering, but just call it anything you want, but when the system calls for water, there is nothing that will satisfy but water, not even whisky.

A baby that has been well and taking at least one quart of milk per day, about eighty-seven per cent of which is water suddenly becomes ill with diarrhea which soon dehydrates it and just when we need fluids to dilute the toxins, they are stopped, because the infant gets most fluids through the milk. This is stopped and a little broth or rice water is given; the former of which acts as fine culture media for the bacilli that are present in some form in almost all cases and the second has but little food value.

In those cases of mechanical diarrheas which usually terminate in ileocolitis, it is well to stop all food for a few hours but this should not be continued for more than twenty-four hours. Then begin feeding and I like Dr. Wilson's idea of "beginning low and going slow;" that is, our milk formula should be about one-third milk and two-thirds water, but try and get sufficient fluids in to prevent dehydration; and gradually increase the milk formula until the baby is getting sufficient milk to take care of its caloric needs. I discontinue the sugar in these feedings until the patient begins improving, then add gradually. In many cases a protein milk serves best. Just here permit me to digress long enough to say that if we do not know caloric needs and values, we should not undertake to treat a child with colitis.

If it is impossible to get sufficient fluids by mouth, then supply them through the bowels; if this fails, resort to either hyperdermoclysis or still better give them intraperitoneally. This is a simple operation which can be done in the home. Give at least 200 c.c. every eight or ten hours as long as needed. Some still believe that strychnine, caffein or camphor should be given as a stimulant, and these may be of value but fluids are our best stimulant and weak tea is fine for this purpose.

To summarize the treatment—First: Unload the stomach of undigestible material either by giving an emetic or using a stomach pump. Irrigate the colon with normal saline or sodium bicarbonate solution which serves a double purpose, first of controlling temperature and second, ridding the colon of retained toxins. Give plenty of fluids. It makes but little difference how we give them just so it is externally, internally and eternally. Feed the baby. Breast milk is best, but if you cannot get breast milk, give some formula of modified cow's milk, which should be boiled; in fact all milk should be boiled that is fed in artificial formulas.

Do not give strong laxatives especially calomel and castor oil. The baby may be given mineral oil which serves as a lubricant and aids nature in passing through the twenty-seven or twenty-eight feet of intestines harmful food that has gotten there and cannot be digested. The patient should be weighed every day when possible so that we can keep a check on loss or gain in weight.

The serums have not proven of special value, although some pediatricians report good results, but this must be limited to those cases where the laboratory findings will help to classify the cases that might be helped by serums.

Dr. Marriott is a strong believer in focal infection as a causative factor and no doubt it is in many cases and if so, it should have attention.

In conclusion, permit me to say that I know many of you will not agree with what has been said regarding medication, especially castor oil, but for fifteen years I gave as much calomel and castor oil as anybody and I am glad to say many of my patients got well in spite of my treatment, but if I've given you the wrong ideas, charge it up to Strong, Bloom, Royster, Mulleherrin, Wilson and many other Southern pediatricians.

During the past four years, I have followed the treatment as outlined in this paper and not a single death certificate is on file in Jackson against Joe Green from death caused by ileocolitis. Time will not permit a discussion of chronic ileocolitis in this paper.

DISCUSSION

Dr. R. A. Strong (Pass Christian): Mr. Chairman, my chance has arrived. You know as we say out here in "rum row," when Joe Green fired that shot across my bow this morning I thought I would have a good opportunity with him this afternoon. I will tell you frankly that I thought it over and I am not going to shoot at Joe Green so badly, because he has the last shot in this thing. He can tear me up. But I am going to hold one thing against him.

You have heard a very constructive paper and it reflects, without any question of a doubt, what I think would be the modern thought, and we certainly have had a world of thoughts on that particular subject.

Going back to 1837 you will find one French pediatrist, de Lord, I think his name was, who tried to classify intestinal disturbances, we will call them. He started by calling them certain things. I have a few notes here from the history.

We will jump down to a period a little later when the term ileocolitis and colitis is used, which represents a period fathered by the German pediatrist, Wiederhofer, who liked to classify his intestinal disturbances anatomically.

Then we jump to the bacteriologic era where we thought bacteriology was the cause of all disturbances. Then we jump down to Keller and Finkelstein who blamed the trouble on nutritional disturbances, advocating the high fat formulae, which was cut down to skimmed milk from whole milk, until now, I think, it is decided, "After all, what is the difference?" Now they are not working so hard on a classification as they are on the matter of treatment.

I think Dr. Green has certainly summarized the treatment very thoroughly. I want to emphasize the point he made concerning the giving of purgatives. First of all, you have a baby who has diarrhea and it is doing everything possible to dehydrate itself. If you come along with castor oil or any purgative and try to increase that peristalsis, you are going to contribute largely to the dehydration and therefore cause an anhydremia, a lack of fluid in the blood.

I think the whole thing can be summarized pretty well the same in the words the German pediatrist, Morrow spoke, three words, toxicose, exsiccose and acidose: toxemia, dehydration, which in turn causes anhydremia and acidosis.

If you combine those three things you have done just about all you can do for the infant. The degree in which it exists depends entirely on the individual case. As Dr. Green has told you, you are going to combat the anhydremia or the exsiccose, the dehydration, with as much fluid as you can possibly get in and get it in in every possible way, resorting of course to the intraperitoneal route of necessary, depending the child.

Alkalis: Select any one you want—bicarbonate of soda and insulin and glucose, well buffeted with glucose—and combat those three condition, toxemia, acidosis, and anhydremia or exsiccosis.

Dr. A. M. Harelson (Stringer): I am sure I am not competent to enlighten this body on the treatment of ileocolitis, and yet, there are some things about it that I think I have found out by experience that might possibly be worth something to somebody.

About ten years ago I became acquainted with the essayist, Dr. Green, and he and I together killed a good many of them down in that part of the country by using calomel and calomel, just as he was talking about. We met several times and we let a lot of our babies die promptly.

I have fully come to the conclusion since my association with him down there and our association together later in other places and with cases of this character, that the best thing we could possibly do for those babies in that condition was to properly feed them. Some may say that I am mistaken when I say that oftentimes the fever that results in a child suffering with ileocolitis is purely a hunger fever. If you will feed that baby properly, that fever oftentimes will drop right down and you will have less trouble with it from the fever standpoint.

It is often the case when you are feeding a baby suffering with ileocolitis that you will give it the bottle containing whatever preparation of milk you intend for it to have, lactic acid or protein milk, or whatever it may be, and the baby will nurse for a little while and then very suddenly quit and you think the baby has all it needs for that particular time. If you will have the mother take up that baby in her arms and lay its stomach on her shoulder and pet it a few times, it will belch a few times and you will find that that stomach was at least half full of wind and the baby didn't have half enough food in its stomach to take care of its requirements. When the baby belches off the wind, lay it down again and it will nurse just about as much again usually, and oftentimes that fever will drop immediately.

There is one other symptom I should like to mention in connection with children suffering form ileocolitis. They suffer considerably with tenesmus. I know that symptom becomes distressing. I don't know whether you have tried this treatment or not, and possibly you have or you may have something that answers the purpose better. The best thing I have found for tenesmus is to give very minute doses of atropin; for instance, take a 1/150 of a grain and put it in an ounce of water and give the baby a teaspoonful of it, and in twenty, thirty or forty minutes you will find in every instance that it is relieved of the distressing symptoms of tenesmus. If you haven't tried it, I think it is worthy of your trial. I give that information to you because it has been part of my experience.

Dr. L. S. Gaudet (Natchez): I am not a pediatrician, but I have had the pleasure of listening to Dr. Green's paper. What struck me so much was the simplicity of treatment, the simplicity of handling the case.

This morning I had the pleasure of listening to the treatment of pneumonia in children. I was also very much interested in that, because I was impressed by the small amount of drug treatment that was given in those cases. As most of you doctors know, our mail every morning and every evening is filled with a great amount of material advertising most of the old remedies under new names at very much higher prices. I am very glad to see that most of us medical men are using less and less drug treatment.

Dr. Green made one remark that impressed me very forcibly, because I have been following up Dr. McImeroth's work in regard to ileocolitis and focal infections in connection with it. As I understand it, at the children's hospital in St. Louis when a child is brought in with an ileocolitis and it doesn't clear up in twenty-four or thirty-six hours under proper diet, then it is presumed that child must have focal infection of some kind and consequently the different specialists are called in and many cases have proven that the child has middle ear trouble.

My idea in rising to make these few remarks is simply to remind you of the fact that when you have a little baby who has some intestinal disturbance that doesn't clear up in twenty-four or thirty-six hours, do not neglect to inquire into the prime cause of such a condition. Possibly there may be some nasal condition, but particularly the ear.

Dr. Joe E. Green (Richton): I appreciate what Dr. Strong, Dr. Harelson and Dr. Gaudet had to say in the discussion of this paper. I tried to cut out everything possible and bring in the salient points that we may use in order to get our babies well.

If there is anything that Mississippi needs today in the medical line, it is more physicians who are willing to give more time to the study of feeding and treating sick infants. Let some negro break his leg and almost any doctor in town can and will give him first-class surgical attention, but too often a mother brings in a baby that is very sick from some intestinal toxemia due to improper feeding and that some physician will not take the time to work out a proper feeding formula for his patient, but instead, writes some prescription containing calomel, castor oil, opiates and bismuth, and instructs the mother to come back in a few days. This treatment is often repeated a few times and far too often results in the doctor telling the mother that "The Lord knew best was why her baby died."

We could easily spend two hours discussing this subject, but just having fifteen minutes, makes it impossible to do more than mention the salient points. I again thank the doctors for their discussion.

ALIMENTARY ANEMIA IN INFANTS AND ITS TREATMENT.*

CECIL LORIO, M. D.,

BATON ROUGE.

There can be found in medical literature dating back to Hippocrates, descriptions of a condition, known then as chlorosis; showing that for many years, anemia, as a paleness or thinness (as they termed it) of the blood, has been recognized. Secondary anemia has long been discussed but only since the middle of the twentieth century has simple anemia found some part of its etiology in nutritional deficiencies. Alimentary anemia, *per se*, is rarely found in the present day medical text book with any lengthy detailed description, as of most other common diseases. So, for that reason, I think a rather superficial analysis of the condition is at this time most appropriate.

Alimentary anemia, otherwise classified as simple anemia due to nutritional insufficiencies, is a rather common condition, existing in the infant, usually before the age of two years and due to an improper balance of diet or rather a diet in which iron and coloring content is not sufficient to replace that excreted; and it is usually found in the child to whom other foods besides milk have been withheld for too long a period. The alimentary anemia described by Czerny differs from the generally accepted views of this type of anemia in that he attributes the underlying etiological factor to an abnormal metabolism resulting in the elaboration of acid products from milk and starches which are toxic to the blood forming paranchyma.

The goat milk anemia described by Brouwer needs only be mentioned, in that, withdrawal of goat's milk and substitution of nutritional foods will cause an immediate amelioration of symptoms. It is also true that in the Balkans, where quite a bit of donkey milk is fed, similar conditions exist. The mild type of alimentary anemia is far more common than is ordinarily supposed, and as in other diseases there are degrees of severity, but the greater number being of the mild type and usually unobserved.

Since the origin of alimentary anemia is problematical and since the consensus of opinion is that of a paucity of iron containing foods and lack of hygienic environment, it is but logical that we enter into some description of the two elements of the blood that are notably effected, that is, the red blood cells and the hemoglobin.

Experimental work on living blood cells by Sabin, has proven that the red blood cells develop from the mesenchyma cells which constitute the blood islands, and under the hematopoietic demands of an anemia these primitive cells are often swept into the circulation and their presence is indicative of a floridity of blood formation.

New erythrocytes are steadily being delivered into the circulation as a result of their growth in an inexpansile environment, and under normal conditions a definite ratio is established between blood formation and those emptying into the blood stream. For instance, in an anemia with an erythopenia and diminished hemoglobin, the condition upsets the ratio between cell formation and destruction and the organisms experiences a red cell intolerance to it and blood formation increases.

Until recently, the function of the red blood cells was thought to be that of transportation of oxygen and by which means the CO_2 was taken from the tissues and excreted by way of the lungs. But experiment has definitely established that the red blood cells act also as a buffer, by maintaining the blood plasma at a constant hydrogen-ion concentration, and more important in consideration of anemia is that they function principally as being the most effective means of water transportation of the

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body. And besides this, the red blood cells maintain a constant ratio between tissue CO_2 and plasma CO_2.

These properties have been attributed to the red cells but in reality it is the hemoglobin with its iron and hematin content that functions principally in caring for the above metabolic functions of the blood, and it is when the need of hemoglobin is urgent that the stimulus maintaining blood formation as its constant high level probably expresses itself.

It is now thought very improbable that after the mature red blood cell enters the blood stream it can increase its hemoglobin content, as it has lost its embryonic structure; so that, in anemic patients, we must make it possible for new cells to appear in the blood stream with more hemoglobin and not depend on the old cell increasing its content from the blood plasma.

To treat effectively these anemias it is necessary to consider the elements of hemoglobin; that substance which is the coloring matter of the red blood cells and which properties are responsible for the many functions of the red blood cells. It is composed principally of two (2) elements, hematin and globin.

The globin is protein and the hematin is the pigment plus iron (being chemically and biologically related to chlorophyll, the coloring matter of plants) and when taken into the body as a food is termed the pigment complex or "pyrrol complex," and its ultimate fate is bile pigments or hemoglobin or urochrome.

The hematin is derived from milk fat in bottle fed and breast fed infants, and in older children from such foods as beef juices, egg yolk, vegetables and to a small extent in cereals.

The iron (which seems to be of such importance in avoiding alimentary anemia), received by a child during the first half years, consists principally of the withdrawal from the storage supply of the liver, for it is during the last three months of pregnancy that the foetus stores up in the liver sufficient iron to amply care for the hemoglobin metabolism in the breast fed infant for about six months. Breast milk contains 1.5 mgm. of iron per quart as compared with cows milk which contains only .2 mgm. per quart. When breast fed, the iron storage is not drawn upon nearly so rapidly as in the artificially fed child. Other supplies of iron and hematin must be available to prevent anemia. In this condition the liver functions principally. Only during the last three months of intrauterine life does the embryo begin to store iron. This explains the cause of twins, or single babies who are born prematurely, being often anemic, as they do not have the full benefit of the liver as an iron storage.

This condition described by the French authors as oligosideremia offers good prognosis and responds quickly to administration of iron.

From the above, it is but logical to conclude that, as an infant reaches the age of 8 to 10 months, when its growth is calling for an increased amount of hemoglobin elements, and supply about this time has become very scant and no articles of diet with these elements are given in sufficient amounts, an anemia will inevitably develop. A bottle fed baby for twelve months without supplementary iron foods will usually develop some degree of alimentary anemia. Breast fed babies are relatively free of this because the iron content of human milk is sufficient to replenish the depletion. Theoretically, the amount of iron intake daily, to cover the needs of the blood growth and to replace the iron which is constantly metabolized and excreted for a one year old child, is from 2 to 2.5 mgm. per day. This is probably somewhat higher than the actual needs and takes into consideration that only 60 per cent of iron consumed is actually used.

When the hemoglobin reaches such low limits as 30-40 or 50 per cent the appetite

usually diminishes and such a child may get into a dystrophic stage and remain as such until the hemoglobin is increased; gastro-intestinal upsets are not infrequent and often are the beginning of a rapid decline in the child's general condition.

In alimentary anemia one can differentiate various grades of pallor which is easily and clearly seen in the face and well portrays in general the degree of pathological blood changes. The most marked form of anemia gives the infant a bluish, transparent appearance, or a waxy, yellowish color. This picture is accentuated by the outstanding bluish veins especially prominent on the skull and abdomen. The ears are transparent with hardly the vestige of a rosy hue and mucus membranes are very pale.

In the treatment of alimentary anemia it is necessary to consider several factors.

Heretofore too little attention has been paid to the factor of diet in regeneration of blood. Whipple and his associates have found that the best regeneration of blood was in those who were on a mixed diet, the most potent factors being chicken gizzards and livers, pig heart muscle, kidney of pig and beef, egg yolk, spinach, beef juice and, to a lesser extent, cereals. A diet rich in carbohydrates and with very little protein permits only a slow regeneration curve in the adult, and it is this that accounts for the so often seen anemic infant who has been fed on condensed milk over a long period of time without supplementary feedings. High carbohydrates conserve in the body certain protein factors and so prevent their entering into formation of new hemoglobin.

As has been pointed out, whenever an anemia has been allowed to remain at a low level for any length of time any factor that influences the regeneration curve is put to the hardest test. Such cases therefore of alimentary anemia as have been present for a considerable time will respond only slowly to dietetic treatment and, in cases of sufficient severity, we must resort to more drastic measures.

General hygienic measures are fundamental in the treatment of anemia. The stimulating effect of ultra-violet rays on metabolism especially on that of the bone marrow is well recognized, so that fresh air, with extensive sunlight or mercury vapor lamps properly applied, are definite stimulation to the blood forming tissues and also an aid to better functioning of all the body organs. The debilitated functions as found in anemia are exhilirated; nutrition is definitely improved; activity of secretions is marked; and the internal organs are better oxygenated.

The use of drugs (iron, arsenic, principally) is a time honored custom and it has been believed and is now conceded by some, to have a definite and beneficial place in our armantarium in the treatment of anemia, but experimental evidence tends to prove more and more their uselessness.

Whipple and his associates in a carefully planned series of experiments with the use of iron and arsenic, call attention to the negative influences upon the curve of hemoglobin regeneration. Blauds pills have been found to be practically inert as compared to different foods such as liver, beef, spinach or egg yolk.

Fowler's solution by mouth and sodium cacadyolate subcutaneously gave only a very slow rise in the hemoglobin curve.

Concluding from his experiments, Whipple says that no drug has been tested which can compare with the food factors in stimulating a rapid regeneration of hemoglobin in anemia, and that his experiments give no support to the time honored csutom of administering iron and certain other drugs in conditions of anemia. So that, from the above discussion, it is but right to conclude that inorganic iron and arsenic have but little influence on anemia. At times, however, some benefits may be derived when they are used in conjunction with organic iron, in which cases Bass and Danzer rec-

ommend the use of saccharated iron carbonate 30 to 60 grs. daily.

The most efficient treatment is the transfusion of blood. This is obvious, because, when blood is put into the circulation, the reserve that has been missing throughout the course of anemia is supplied, and thereby the burden of the blood formation is not so imperative from the hematopoetic centers and at the end of 20 to 30 days the blood forming centers are in better condition to supply mature cells, provided the proper stimulus is given during the interval. It sometimes happens that one transfusion does not suffice and several may be necessary in order to allow the equilibrium to be maintained between the destroyed and newly formed red blood cells.

In the administration of blood from donor to recipient it is necessary either to type the bloods, using either the Moss or the Jansky classification, or to use the method of cross agglutination. Cross agglutination of donor's to recipient's serum and vice versa is the only absolute reliable method because Guthrie and Huch of Johns Hopkins in 1923 demonstrated by direct tests and by absorption experiments the existence of a third iso-agglutine and a third iso-agglutinogen in human blood making 27 groups possible in contrast to the Morse system of 4 groups 1-2-3-4. So that cross agglutination would be the only positive method of determining the compatibility of bloods.

The agglutins present at birth are usually of a low concentration and increase gradually during infancy up to the age of 2 years when the adult stage is reached. Only in 20 per cent of cases in which cells agglutinate does hemolysis occur, and even in infants under 2 years where the strength of the agglutins are unknown the chances of hemolysis are only 1-1000. So that in an emergency, blood may be given (of course with 1-1000 risk) to an infant without examinations for agglutins. This applies principally to those under 6 months to one-year. Transfusions may be either by the direct or citrated method. The citrated method is by all means the simpliest and can be done with only the aid of a nurse. Intravenously the veins of choice are the external jugular and the fontanell, either route being a fairly simple proceedure. In doing the citrated method it is necessary to have the blood diluted with a minimum of .25 per cent citrate to inhibit coagulation.

To the pediatrician, by far the most important contribution in blood researches is the work of Sansby in 1923 who showed by experiments on rabbits that the red blood corpuscles of citrated blood introduced into the peritoneal cavity are absorbed quantitatively without disentegration of the red blood cells into the general circulation and that this proceedure can be carried out without harm. The red blood cells are absorbed through the lymphatic vessels which establishes drainage between the peritoneum and the cisterna chili. Cross sections of the peritoneum of the diaphram shows the red blood cells being taken up between the endothelial cells.

The serum of the blood is rapidly absorbed but it may take a week before all of the red blood cells are completely removed from the peritoneal cavity.

It is throught not necessary to determine agglutination for intraperitoneal transfusion though in my opinion it would be more nearly safe to do so.

The accepted maximum dose of 15 c.c. of blood to pound of body weight, should permit an increase of something over 2 million red blood cells per c.c. of blood and an increase of 20 to 30 per cent hemoglobin.

The simplicity of the technic, the assurance of absorption and the favorable results, warrants its use in many cases. Intraperitoneal transfusion in my hands, so far, has been very satisfactory and my choice method of administration wherever the case is of such a nature. Its use in the

treatment of alimentary anemia supplemented by specific foods with sufficient iron and hematin content has proven to me to be most satisfactory, with results which are surpassed by no other course of treatment in present use.

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DISCUSSION

Dr. R. T. Lucas (Shreveport, La.): I think Dr. Lorio has covered the subject too well for me to try to criticize it except to thank him for bringing it to the attention of the section.

I think in the feeding of children, babies from the ages of about six or eight months to five or six years, that the balancing of proteins and carbohydrates is often not what it ought to be. It may be an absence of the iron content that makes it apparent. In these anemias I put children on scraped beef, starting rather early, or merely increasing the protein percentage of their food by giving eggs, liver and any other kind of meat the child will take, but in some cases there is nothing you can do for them that will give quite as remarkable and prompt results as blood transfusion will give.

I have not had any experience with blood intraperitoneally. I have been a little reluctant to use it that way. I do use diphtheria antitoxin by that route. Unless it is an emergency and you can't get the blood in any other way, I don't believe we ought to go into the fontanel. It is easy enough to withdraw blood from the fontanel, and of course you can give a transfusion by that route. It is a very simple procedure, but I feel some hesitancy in going near the brain tissue if I can reasonably avoid it. I frequently use blood intramuscularly with satisfactory results.

The administration of blood is a very valuable procedure, and I think in a large measure the use of blood as a stimulating agent to get your patient back where he can take care of himself when in a very low state, is undoubtedly a life saver in a large percentage of cases.

Just before coming I had a patient with pyloric stenosis, who was in bad shape. In the absence of some blood given about twelve hours previous to operation I don't believe the child would have survived. As a matter of fact the child did respond very promptly.

I think Dr. Lorio is to be congratulated on bringing us such an important and pertinent subject.

Dr. C. J. Bloom (New Orleans, La.): I am sorry I have missed the main part of the discussion. I had an opportunity to read over the paper of Dr. Lorio. I thought it would not be a bad plan to mention casually something that might be rather confusing to most of us. In very young children, especially the type described in alimentary anemia, we must consider what would normally be the blood picture. We know that the hemoglobin in a child two years of age seldom exceeds 80 per cent normal, and that at times we are quite surprised to find just how low the red count is, which very often runs between 4,000,000 and 5,000,000.

This type of alimentary anemia is met with in all cases, I mean those that are fed both artificially and from the breast. Whether it is due potentially to an unbalanced diet, although years ago we considered breast milk a rather balanced diet, we know today there are so many influences that would change the content of milk, both mothers' milk and cow's milk, that we have been prone to add, either in the way of complementary feedings or supplementary feedings, to the diet of a child as early as the fifth or sixth month. We give fruits as early as the first month.

I know of no plan of treatment that gives us quite as good results as the use of blood in relieving alimentary anemia. I have used various preparations of arsenic and iron. I have gotten the best results through the use of iron and quicker results with solarson than with cocodylate of soda. I think the best and quickest plan of

treatment is the use of whole blood. In these cases I generally give from 15 to 30 c.c.'s of blood. I do not citrate it. I do not have to type it. Give it under the skin in the flanks of the abdomen, either once or twice weekly until the hemoglobin and the red count show an appreciable increase.

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Dr. J. E. Bailey (New Orleans, La.): It was not my purpose to offer anything on this excellent paper of Dr. Lorio's when I came in, but he mentioned quartz light therapy, and I couldn't resist the temptation to make a plea for it.

We have used it over a period of six or seven years in the treatment of the secondary anemias, and we have used it with very gratifying results. We can always expect, and usually get increase in the red blood cells, in platelets, in the hemoglobin, and an increase in the phosphorus and calcium content of the blood. The technic is simple. There is nothing complicated to it. You can all use it, and the results are usually gratifying. It is well worth trying in these anemias, and I am sure you would be well pleased with the results.

Dr. F. M. Johns (New Orleans, La.): I should like to compliment Dr. Lorio on his paper in general. I think we have a multiplicity of names with regard to the types of anemia. I should like to suggest that he change the title. I think the tendency these days is to complicate the types of anemia with names relating to the etiology and we have entirely too many.

I think this form of secondary anemia is incidental to an iron deficiency.

I would like to call attention to one of our scientific exhibits. Dr. Wintrobe has made a notable study with regard to the estimation of hemoglobin. By a rather careful and elaborate method he has been able to show that the estimation of hemoglobin in anemias by the various colorimetric methods vary so that we can hardly tell by any of the ordinary instruments whether we are dealing with a primary or secondary type anemia. With one method we will obtain a percentage of 70 per cent, and with another method we may obtain 10 to 20 per cent more or less. I believe that the average determination of hemoglobin is extremely inaccurate, and that in the differentiation of anemias more care should be given to this very important point than to merely soak a piece of filter paper with a drop of blood and match it against any set of red colors that may be furnished often by patent medicine vendors.

In border line cases especially, I would urge you to pay more attention to the method of determining all of the factors needed in differentiating a type anemia and which includes not only the hemoglobin but the erythrocyte count, color index, morphological and staining characteristics of the cells and their resistance to hypotonic salt solutions.

Dr. Cecil Lorio (Baton Rouge, La., closing): In regard to Dr. Johns' request that I change the title, I don't think it would be quite possible to change it and yet get it before the pediatricians in any other way, because it is a condition called alimentary anemia in pediatrics, and in a recent Journal it is called alimentary anemia due to sprue. Of course, it is confusing, but at the same time I don't think it would be possible to change the title. I think we will leave it to the author of some book to change the title.

I want to thank very much the doctors that have discussed my paper, and for the discussion they have given.

GAS ANESTHESIA IN ORAL, LARYNGEAL, LUNG AND OCCULAR SURGERY.*

ANSEL CAINE, M. D.

NEW ORLEANS.

From the standpoint of gas anesthesia these cases present difficulties that must be overcome to be successful. The difficulties are not the same as for laparotomies, where relaxation is the bug bear, but are concerned with the administrative side.

It can be readily seen that anesthesia, when a mask covering both the nose and mouth can be used, presents a different picture from anesthesia, when the mouth or nose is uncovered. We shall endeavor to show how these problems have been solved in simple ways.

In chest surgery, where the pleura has been opened, there is collapse of the lung unless it is held against the chest wall by adhesions. In man, oxygenation can usually be maintained with one lung, but this is not satisfactory, either from the surgeons or anesthetists point of view. Unless

*Read before the Louisiana State Medical Society, New Orleans, April 9-11, 1929.

ALIMENTARY ANEMIA IN INFANTS AND ITS TREATMENT.*

CECIL LORIO, M. D.,

BATON ROUGE.

There can be found in medical literature dating back to Hippocrates, descriptions of a condition, known then as chlorosis; showing that for many years, anemia, as a paleness or thinness (as they termed it) of the blood, has been recognized. Secondary anemia has long been discussed but only since the middle of the twentieth century has simple anemia found some part of its etiology in nutritional deficiencies. Alimentary anemia, *per se*, is rarely found in the present day medical text book with any lengthy detailed description, as of most other common diseases. So, for that reason, I think a rather superficial analysis of the condition is at this time most appropriate.

Alimentary anemia, otherwise classified as simple anemia due to nutritional insufficiencies, is a rather common condition, existing in the infant, usually before the age of two years and due to an improper balance of diet or rather a diet in which iron and coloring content is not sufficient to replace that excreted; and it is usually found in the child to whom other foods besides milk have been withheld for too long a period. The alimentary anemia described by Czerny differs from the generally accepted views of this type of anemia in that he attributes the underlying etiological factor to an abnormal metabolism resulting in the elaboration of acid products from milk and starches which are toxic to the blood forming paranchyma.

The goat milk anemia described by Brouwer needs only be mentioned, in that, withdrawal of goat's milk and substitution of nutritional foods will cause an immediate amelioration of symptoms. It is also true that in the Balkans, where quite a bit of donkey milk is fed, similar conditions exist. The mild type of alimentary anemia is far more common than is ordinarily supposed, and as in other diseases there are degrees of severity, but the greater number being of the mild type and usually unobserved.

Since the origin of alimentary anemia is problematical and since the consensus of opinion is that of a paucity of iron containing foods and lack of hygienic environment, it is but logical that we enter into some description of the two elements of the blood that are notably effected, that is, the red blood cells and the hemoglobin.

Experimental work on living blood cells by Sabin, has proven that the red blood cells develop from the mesenchyma cells which constitute the blood islands, and under the hematopoietic demands of an anemia these primitive cells are often swept into the circulation and their presence is indicative of a floridity of blood formation.

New erythrocytes are steadily being delivered into the circulation as a result of their growth in an inexpansile environment, and under normal conditions a definite ratio is established between blood formation and those emptying into the blood stream. For instance, in an anemia with an erythopenia and diminished hemoglobin, the condition upsets the ratio between cell formation and destruction and the organisms experiences a red cell intolerance to it and blood formation increases.

Until recently, the function of the red blood cells was thought to be that of transportation of oxygen and by which means the CO_2 was taken from the tissues and excreted by way of the lungs. But experiment has definitely established that the red blood cells act also as a buffer, by maintaining the blood plasma at a constant hydrogen-ion concentration, and more important in consideration of anemia is that they function principally as being the most effective means of water transportation of the

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body. And besides this, the red blood cells maintain a constant ratio between tissue CO_2 and plasma CO_2.

These properties have been attributed to the red cells but in reality it is the hemoglobin with its iron and hematin content that functions principally in caring for the above metabolic functions of the blood, and it is when the need of hemoglobin is urgent that the stimulus maintaining blood formation as its constant high level probably expresses itself.

It is now thought very improbable that after the mature red blood cell enters the blood stream it can increase its hemoglobin content, as it has lost its embryonic structure; so that, in anemic patients, we must make it possible for new cells to appear in the blood stream with more hemoglobin and not depend on the old cell increasing its content from the blood plasma.

To treat effectively these anemias it is necessary to consider the elements of hemoglobin; that substance which is the coloring matter of the red blood cells and which properties are responsible for the many functions of the red blood cells. It is composed principally of two (2) elements, hematin and globin.

The globin is protein and the hematin is the pigment plus iron (being chemically and biologically related to chlorophyll, the coloring matter of plants) and when taken into the body as a food is termed the pigment complex or "pyrrol complex," and its ultimate fate is bile pigments or hemoglobin or urochrome.

The hematin is derived from milk fat in bottle fed and breast fed infants, and in older children from such foods as beef juices, egg yolk, vegetables and to a small extent in cereals.

The iron (which seems to be of such importance in avoiding alimentary anemia), received by a child during the first half years, consists principally of the withdrawal from the storage supply of the liver, for it is during the last three months of pregnancy that the foetus stores up in the liver sufficient iron to amply care for the hemoglobin metabolism in the breast fed infant for about six months. Breast milk contains 1.5 mgm. of iron per quart as compared with cows milk which contains only .2 mgm. per quart. When breast fed, the iron storage is not drawn upon nearly so rapidly as in the artificially fed child. Other supplies of iron and hematin must be available to prevent anemia. In this condition the liver functions principally. Only during the last three months of intrauterine life does the embryo begin to store iron. This explains the cause of twins, or single babies who are born prematurely, being often anemic, as they do not have the full benefit of the liver as an iron storage.

This condition described by the French authors as oligosideremia offers good prognosis and responds quickly to administration of iron.

From the above, it is but logical to conclude that, as an infant reaches the age of 8 to 10 months, when its growth is calling for an increased amount of hemoglobin elements, and supply about this time has become very scant and no articles of diet with these elements are given in sufficient amounts, an anemia will inevitably develop. A bottle fed baby for twelve months without supplementary iron foods will usually develop some degree of alimentary anemia. Breast fed babies are relatively free of this because the iron content of human milk is sufficient to replenish the depletion. Theoretically, the amount of iron intake daily, to cover the needs of the blood growth and to replace the iron which is constantly metabolized and excreted for a one year old child, is from 2 to 2.5 mgm. per day. This is probably somewhat higher than the actual needs and takes into consideration that only 60 per cent of iron consumed is actually used.

When the hemoglobin reaches such low limits as 30-40 or 50 per cent the appetite

usually diminishes and such a child may get into a dystrophic stage and remain as such until the hemoglobin is increased; gastro-intestinal upsets are not infrequent and often are the beginning of a rapid decline in the child's general condition.

In alimentary anemia one can differentiate various grades of pallor which is easily and clearly seen in the face and well portrays in general the degree of pathological blood changes. The most marked form of anemia gives the infant a bluish, transparent appearance, or a waxy, yellowish color. This picture is accentuated by the outstanding bluish veins especially prominent on the skull and abdomen. The ears are transparent with hardly the vestige of a rosy hue and mucus membranes are very pale.

In the treatment of alimentary anemia it is necessary to consider several factors.

Heretofore too little attention has been paid to the factor of diet in regeneration of blood. Whipple and his associates have found that the best regeneration of blood was in those who were on a mixed diet, the most potent factors being chicken gizzards and livers, pig heart muscle, kidney of pig and beef, egg yolk, spinach, beef juice and, to a lesser extent, cereals. A diet rich in carbohydrates and with very little protein permits only a slow regeneration curve in the adult, and it is this that accounts for the so often seen anemic infant who has been fed on condensed milk over a long period of time without supplementary feedings. High carbohydrates conserve in the body certain protein factors and so prevent their entering into formation of new hemoglobin.

As has been pointed out, whenever an anemia has been allowed to remain at a low level for any length of time any factor that influences the regeneration curve is put to the hardest test. Such cases therefore of alimentary anemia as have been present for a considerable time will respond only slowly to dietetic treatment and, in cases of sufficient severity, we must resort to more drastic measures.

General hygienic measures are fundamental in the treatment of anemia. The stimulating effect of ultra-violet rays on metabolism especially on that of the bone marrow is well recognized, so that fresh air, with extensive sunlight or mercury vapor lamps properly applied, are definite stimulation to the blood forming tissues and also an aid to better functioning of all the body organs. The debilitated functions as found in anemia are exhilirated; nutrition is definitely improved; activity of secretions is marked; and the internal organs are better oxygenated.

The use of drugs (iron, arsenic, principally) is a time honored custom and it has been believed and is now conceded by some, to have a definite and beneficial place in our armantarium in the treatment of anemia, but experimental evidence tends to prove more and more their uselessness.

Whipple and his associates in a carefully planned series of experiments with the use of iron and arsenic, call attention to the negative influences upon the curve of hemoglobin regeneration. Blauds pills have been found to be practically inert as compared to different foods such as liver, beef, spinach or egg yolk.

Fowler's solution by mouth and sodium cacadyolate subcutaneously gave only a very slow rise in the hemoglobin curve.

Concluding from his experiments, Whipple says that no drug has been tested which can compare with the food factors in stimulating a rapid regeneration of hemoglobin in anemia, and that his experiments give no support to the time honored csutom of administering iron and certain other drugs in conditions of anemia. So that, from the above discussion, it is but right to conclude that inorganic iron and arsenic have but little influence on anemia. At times, however, some benefits may be derived when they are used in conjunction with organic iron, in which cases Bass and Danzer rec-

ommend the use of saccharated iron carbonate 30 to 60 grs. daily.

The most efficient treatment is the transfusion of blood. This is obvious, because, when blood is put into the circulation, the reserve that has been missing throughout the course of anemia is supplied, and thereby the burden of the blood formation is not so imperative from the hematopoetic centers and at the end of 20 to 30 days the blood forming centers are in better condition to supply mature cells, provided the proper stimulus is given during the interval. It sometimes happens that one transfusion does not suffice and several may be necessary in order to allow the equilibrium to be maintained between the destroyed and newly formed red blood cells.

In the administration of blood from donor to recipient it is necessary either to type the bloods, using either the Moss or the Jansky classification, or to use the method of cross agglutination. Cross agglutination of donor's to recipient's serum and vice versa is the only absolute reliable method because Guthrie and Huch of Johns Hopkins in 1923 demonstrated by direct tests and by absorption experiments the existence of a third iso-agglutine and a third iso-agglutinogen in human blood making 27 groups possible in contrast to the Morse system of 4 groups 1-2-3-4. So that cross agglutination would be the only positive method of determining the compatibility of bloods.

The agglutins present at birth are usually of a low concentration and increase gradually during infancy up to the age of 2 years when the adult stage is reached. Only in 20 per cent of cases in which cells agglutinate does hemolysis occur, and even in infants under 2 years where the strength of the agglutins are unknown the chances of hemolysis are only 1-1000. So that in an emergency, blood may be given (of course with 1-1000 risk) to an infant without examinations for agglutins. This applies principally to those under 6 months to one-year. Transfusions may be either by the direct or citrated method. The citrated method is by all means the simpliest and can be done with only the aid of a nurse. Intravenously the veins of choice are the external jugular and the fontanell, either route being a fairly simple proceedure. In doing the citrated method it is necessary to have the blood diluted with a minimum of .25 per cent citrate to inhibit coagulation.

To the pediatrician, by far the most important contribution in blood researches is the work of Sansby in 1923 who showed by experiments on rabbits that the red blood corpuscles of citrated blood introduced into the peritoneal cavity are absorbed quantitatively without disentegration of the red blood cells into the general circulation and that this proceedure can be carried out without harm. The red blood cells are absorbed through the lymphatic vessels which establishes drainage between the peritoneum and the cisterna chili. Cross sections of the peritoneum of the diaphram shows the red blood cells being taken up between the endothelial cells.

The serum of the blood is rapidly absorbed but it may take a week before all of the red blood cells are completely removed from the peritoneal cavity.

It is throught not necessary to determine agglutination for intraperitoneal transfusion though in my opinion it would be more nearly safe to do so.

The accepted maximum dose of 15 c.c. of blood to pound of body weight, should permit an increase of something over 2 million red blood cells per c.c. of blood and an increase of 20 to 30 per cent hemoglobin.

The simplicity of the technic, the assurance of absorption and the favorable results, warrants its use in many cases. Intraperitoneal transfusion in my hands, so far, has been very satisfactory and my choice method of administration wherever the case is of such a nature. Its use in the

treatment of alimentary anemia supplemented by specific foods with sufficient iron and hematin content has proven to me to be most satisfactory, with results which are surpassed by no other course of treatment in present use.

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DISCUSSION

Dr. R. T. Lucas (Shreveport, La.): I think Dr. Lorio has covered the subject too well for me to try to criticize it except to thank him for bringing it to the attention of the section.

I think in the feeding of children, babies from the ages of about six or eight months to five or six years, that the balancing of proteins and carbohydrates is often not what it ought to be. It may be an absence of the iron content that makes it apparent. In these anemias I put children on scraped beef, starting rather early, or merely increasing the protein percentage of their food by giving eggs, liver and any other kind of meat the child will take, but in some cases there is nothing you can do for them that will give quite as remarkable and prompt results as blood transfusion will give.

I have not had any experience with blood intraperitoneally. I have been a little reluctant to use it that way. I do use diphtheria antitoxin by that route. Unless it is an emergency and you can't get the blood in any other way, I don't believe we ought to go into the fontanel. It is easy enough to withdraw blood from the fontanel, and of course you can give a transfusion by that route. It is a very simple procedure, but I feel some hesitancy in going near the brain tissue if I can reasonably avoid it. I frequently use blood intramuscularly with satisfactory results.

The administration of blood is a very valuable procedure, and I think in a large measure the use of blood as a stimulating agent to get your patient back where he can take care of himself when in a very low state, is undoubtedly a life saver in a large percentage of cases.

Just before coming I had a patient with pyloric stenosis, who was in bad shape. In the absence of some blood given about twelve hours previous to operation I don't believe the child would have survived. As a matter of fact the child did respond very promptly.

I think Dr. Lorio is to be congratulated on bringing us such an important and pertinent subject.

Dr. C. J. Bloom (New Orleans, La.): I am sorry I have missed the main part of the discussion. I had an opportunity to read over the paper of Dr. Lorio. I thought it would not be a bad plan to mention casually something that might be rather confusing to most of us. In very young children, especially the type described in alimentary anemia, we must consider what would normally be the blood picture. We know that the hemoglobin in a child two years of age seldom exceeds 80 per cent normal, and that at times we are quite surprised to find just how low the red count is, which very often runs between 4,000,000 and 5,000,000.

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In chest surgery, where the pleura has been opened, there is collapse of the lung unless it is held against the chest wall by adhesions. In man, oxygenation can usually be maintained with one lung, but this is not satisfactory, either from the surgeons or anesthetists point of view. Unless

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the aim of the operation is to collapse the lung, collapse of the lung is not desirable. It is possible to maintain inflation of the lung by increasing the pressure under the mask to the point of maintainence of the lung against the chest wall. This is done under vision and when the lung is properly inflated the pressure is kept at that point. This is done by closing the expiratory valve to the point where it takes just the required pressure to lift it, and the required pressure is determined by the pressure necessary to keep the lung at the desired level in the chest.

Not nearly so simple is anesthesia in throat, laryngeal and tracheal surgery. Here the mouth is open or the larynx or trachea is open. Drs. Arthur Guedel and Ralph Waters have designed intratracheal tubes, having a tissue rubber inflatable bladder surrounding it near the inserted opening. A very small tube connects with the inside of the tissue bladder. and, when the tube is inserted into the trachea the bladder is blown up, thus preventing a leak around the tube and making the tube of the trachea continuous with the intralaryngeal or tracheal tube that has been inserted. Then anesthesia becomes a simple problem again.

This tube is often in the way in throat operations, but, when used to them, operators seem not to be bothered. The insertion of the tube requires some little skill as well as speed if an interrupted anesthesia is to be maintained.

For oral surgery the problem is more simple, and has been made very efficient. A device for delivering the gases into the pharynx, just at the opening into the larynx, is what is needed. Others will work, but Dr. McKesson made me one, improving on my idea somewhat. Soft rubber tubes, of as large caliber as possible, are used, and are attached to leads from the main hose from the apparatus. An expiratory valve is very desirable. After anesthesia has been induced in the usual way with the mask, the mask is quickly removed from the hose, and this attachment substituted. The tubes, which have been previously well lubricated, are quickly inserted through the nose, pledgets of cotton seal the outlet around the tubes at the external nasal meatus, the mouth is opened and the gag inserted, the tongue is pushed back into the throat against the tubes and gauze packs effectually prevent oral breathing. As much dental work as is desired can now be done. In the same way we anesthetise for resection of the jaw, removal of a portion of the tongue or of the lip, cauterization of the mouth, etc.

Where the nose is to operated on, we use the device of Dr. McKesson designed for oral administration. This is all right provided the patient does not vomit.

When the eye or frontal sinuses are to be operated we use tubes as for oral work, but the attachment is different, making it possible to get out of the way of the operator entirely. We have found this method of anesthesia very satisfactory, even over long periods as in operations for squint.

DISCUSSION.

Dr. Homer Dupuy (New Orleans): One would expect such a master in anesthesia as Dr. Caine to keep moving along progressive lines. The Caine-McDermott apparatus, the first of its kind, has proven invaluable in our surgery of the head. The many modifications testify to its intrinsic merits. Many technical difficulties surround oral surgery. It is encouraging to learn that Caine is still trying to facilitate our work by bringing gas anesthesia to our service through his more recently constructed nasal apparatus. It certainly seems indicated when ether is contraindicated.

Dr. Ansel Caine (closing): I haven't anything to say, Mr. Chairman, more than I have already said.

Question: In sinus work of the young, where you are forced to use ether and you have such a great amount of bleeding, nosema, and constantly have to pack off or else have to use a very small suceion tip in order to attempt sinus work, I should like to know something about the use of the bronchoscope and how you would use it with this apparatus.

Dr. Caine: You can't use a bronchoscope unless you depend on those two little tubes, with the mouth wide open and blow the gas through.

You can't use a bronchoscope. The gas forms a wave just as you see it on a hot day when the air is rising over a cotton patch. The ether is hard to see because it forms a wave, and gas does the same thing.

For work in the antrum and on the frontal sinuses, it is very easy with this little mouthpiece and these tubes.

I thank you very, very much. I am sorry I wasn't able to give the other paper because it would have been more interesting.

THE PLACE OF ETHYLENE ANESTHESIA.*

JAMES T. NIX, M. D.

NEW ORLEANS.

Martzloff, in Surgery, Gynecology and Obstetrics, August. 1928, page 186, says, "Surgical anesthesia is an integral part in operative technic . . . The correct employment of ethylene — carbon dioxide-oxygen mixtures with minimal amounts of ether is destined, I am certain, to lower mortality."

It is the object of this paper to present to the Louisiana State Medical Society:

1. Personal testimony in favor of ethylene as a general anesthetic.

2. To offer a summary compilation of the views, favorable and antagonistic, of others.

3. To draw conclusions after a careful study and analysis of the statistics of ethylene, here and elsewhere.

In doing so the subject will be handled from the following angles:

1. A review of the anesthetics at Hotel Dieu, New Orleans.

2. Personal experiences with its use.

3. Evaluation of the opinions of others determined by

(a) Search of the literature.

(b) Information secured by private correspondence and from the answers to a questionnaire letter that was sent to 100 hospitals in this country.

*Read before the Louisiana State Medical Society, New Orleans, April 9-11, 1929.

REVIEW OF THE ETHYLENE ANESTHESIAS AT HOTEL DIEU, NEW ORLEANS.

There has been no immediate mortality from this anesthetic, and only one case where ethylene might be considered as a factor in causing death, although after investigating this case, it is my personal belief and that of the surgeon in charge that ethylene played a very unimportant role, if any at all, in the fatality. Ethylene has been used over 7,000 times at Hotel Dieu since March, 1924.

In 1924 only two surgeons used the anesthetic. In 1928, more than eighty employed the gas one or more times in approximately 3,068 operations. During the past year, four or five 2,800 gallon tanks of ethylene are used every month as compared to four gallons for 1927, three for 1926, one and a half for 1925, and one for 1924.

Although the total number of operations at our hospital has remained practically the same during the last five years there have been no explosions because of the static spark. One inconsequential accident occurred when the mixture beneath the sheets of an operating table caught fire as the cautery was being used. At the time, however, the gas had been turned off, and no harm resulted.

During the month of February, 1929, in 89 per cent of the operations ethylene was given, and in 72 per cent of them ethylene and oxygen without other supplement was given.

Whenever the choice of an anesthetic is left to a house anesthetist, ethylene and oxygen is used, ether is only added in a small percentage of these cases, and in such instances the proportion of ether compared to ethylene is relatively insignificant.

In the obstetrical department at Hotel Dieu ethylene has been given three or four

hundred times, although the exact number I have not determined. It is the anesthetic of choice for normal labor. When complications present, it is usually substituted by ethylene and ether, ether, or chloroform. The Gwathmey synergistic rectal anesthesia is seldom employed.

PERSONAL EXPERIENCE.

The author's personal opinion has not changed from that given in the article read on October 22, 1928, before the Orleans Parish Medical Society, although 738 additional anesthetics of ethylene and oxygen have been used, the total numbering well above 2,000.

I shall again direct your attention to a few points.

1. Explosiveness of dilute mixtures is admitted and recognized everywhere. Nearly all explosions have been caused by static electricity which can be safely overcome.

Experiments by the General Electric Company at the Presbyterian Hospital in Chicago showed two means of combating the static spark, one by raising the humidity, and the other by the careful grounding of apparatus in the operating room.

In New Orleans and places similarly situated geographically the static electricity in the atmosphere, even in the the coldest weather, never produces a spark because of the high humidity. Therefore, this one great problem of the static spark and the unavoidable explosion is eliminated.

Experiments have shown that whenever the humidity is 50 or above the danger of ethylene explosions from the static spark is practically nil. In the Annual Meterological Summary of New Orleans for 1928, furnished by the Weather Bureau, United States Department of Agriculture, and compiled by Dr. Isaac M. Cline, the 7 A. M. humidity of New Orleans is never less than 78 and is usually above 82. The lowest humidity is reached about noon. The lowest recorded during the last year was 53; the average, however, is above 60. At 7 P. M. the average humidity is about 70. Therefore, the fear of explosions from this source is negligible.

Some men use the cautery in the operating room. I do personally, but only for severing an appendix stump. At this time the anesthetic is turned off, the windows are raised, a fan is usually turned on, directing the gas away from the cautery, and only a large, well ventilated room is employed.

2. Relaxation the equal of ether and chloroform cannot be secured at all times. Satisfactory surgical relaxation, sufficient for 90 per cent of all abdominal operations can usually be obtained.

A preliminary hypodermic of morphin and atropin is always given. In a few instances a small percentage of ether is given during exploration, or effecting the delivery of a viscus or in closing the incision. The amount of ether given is minimal, seldom more than a drachm.

The addition of a local anesthetic is practised by some and is a distinct aid when employed. Dr. George W. Crile, probably the largest user of nitrous oxide in the world, many years ago simplified the technic of closing abdominal incisions, especially of the upper abdomen. Local anesthesia is combined with nitrous oxid-oxygen analgesia to secure relaxation. Interrupted figure of eight sutures are used going through all layers of abdominal wall beneath the skin, the small loop of the eight being innermost and catches up peritoneum and possibly a small bit of muscle, if the peritoneum has a tendency to tear. These sutures are placed about one-half inch apart in the length of the incision.

At the present writing, March 21, 1929, there are on our service at Hotel Dieu one cholecystostomy (a female weighing 270 pounds who had an acutely infected gall bladder with stones), one cholecystectomy

for chronic cholecystitis, one posterior gastro-enterostomy for extensive malignancy at pylorus, a nephrotomy with drainage of kidney pelvis due to a blocked ureter, three appendectomies with drainage for suppurative appendicitis, one a child three years old, and one bone graft for an ununited fracture of the tibia, four years' duration. The gastro-enterostomy was on the table two hours and twenty minutes. In this instance alone ether was added for ten minutes while the stomach and jejunum were being coapted. Less than two drachms of ether was used. The patient was awake and spoke to the anesthetist before leaving the operating room. All of the others received only ethylene and oxygen anesthesia.

The patient with the acutely infected gall bladder and stones presented evidence of a toxic nephritis on the day of the operation. She was operated as an emergency. Urinalysis on the same day four hours post-operative showed 6 per cent albumen. The nephritis was incited probably because of the acute infection and the fact that she had been under the influence of morphin for pain the forty-eight hours previous. Mrs. P. had a normal parturition three months before. During the entire pregnancy at no time was there evidence of nephritis or hypertension. An acute suppression of urine appeared on the fourth day, and only after exhaustive measures of treatment were instituted, including especially an intravenous drip of 5 per cent glucose solution, did the kidneys again function. A specimen of urine by catheter on the fifth day showed 25 per cent albumen. The patient was profoundly shocked, the blood pressure being too low to be determined.

The cholecystectomy and nephrotomy presented no difficulties on the operating table, post-operative convalescence in each instance being simple and uncomplicated.

High temperature following ethylene anesthesia in the summer months has not been our experience. This hyperpyrexia during the summer months does occur, but I would think it more frequently follows ether anesthesia.

For prolonged anesthesia, ethylene is the ideal inhalant anesthetic in our opinion, and the expression of other recorded testimony seems to confirm our view.

On the other hand, the ear, nose and throat physicians associated with us do not use ethylene in their work.

In my personal experience I have seen one immediate death from ether, many probable indirect ones, and two rather severe explosions when the fumes of ether were ignited by the spark of a suction machine. I have seen no immediate nor delayed deaths from ethylene.

SUMMARY REVIEW.

The criticisms of ethylene and oxygen anesthesia have been most satisfactorily answered and the objections overcome by able anesthetists and scientists throughout North America, and surely there is no greater authority in anesthesia anywhere than we have in New Orleans in Dr. Caine, whose criticism of my previous paper you have already read.

I shall not burden you with the opinions of many others but shall only give a few quotations from those who apparently have had the greatest experience.

A letter from Dr. Arno Luckhardt dated October 30, 1928, reads as follows: "In upper abdominal work this anesthetic is not always uniformly successful. In such instances small quantities of ether are used together with ethylene in order to give a more perfect relaxation; this amounts on the whole to not more than a few teaspoonfuls of ether. Ordinarily, however, ethylene oxygen suffices."

Quoting from a letter of Dr. John B. Lundy, the Mayo Clinic, "In 1927 ethylene was used in 33.5 per cent of the total anesthesias. In one of every three anesthesias in which ethylene was used, ether was add-

ed. Ether was usually added for intra-abdominal operations . . .Ethylene is non-toxic and without marked effect on ordinary blood pressures."

George A. Johnston, in the California and Western Medical Journal of August, 1927, 6:216-218, states, "Ether is sometimes necessary for complete relaxation, one ounce of which will suffice for two hours."

Sanford Rosenthal, of the department of Pharmacology, McGill University, Montreal, Canada, in Anesthesia and Analgesia, September-October, 1928, in a paper entitled "The Effects of Anesthetics on Hepatic Function" after a careful study and comparison of ether, nitrous oxide and chloroform concludes, "Ethylene would seem to be the anesthetic of choice for operations in severe liver disease."

Dr. Luckhardt, in Anesthesia and Analgesia, January-February, 1928, concerning ethylene shock says, "No such thing exists." He has taken ethylene over two hundred times with no untoward results. So called thyroid deaths he believes to be only a surmise.

G. Leonard Lillies of Melbourne, Australia, in Anesthesia and Analgesia, July-August, 1928, page 205, states that more than half of his patients receive ethylene and oxygen without ether. Others have varying small amounts of ether. He reports twenty-three cholecystectomies and gastrectomies, six gastro-enterostomies and one cholecystostomy with ethylene and oxygen.

Hugh Cabot of the department of Surgery, University of Michigan Hospital, Ann Arbor, Michigan, in Annals of Surgery, August, 1927, reported 11,607 cases without immediate mortality. In his conclusion he stated, "In our practice it has practically pushed nitrous oxide from the field and will, we believe, for ordinary surgical practice, supercede it. It appears to be remarkably free from danger, except that possibly resulting from explosions. Occasionally for work in the upper abdomen it must be combined with other anesthetic aids."

The writings on ethylene are most voluminous, most of them extolling the many advantages of the anesthetic. Time prohibits me quoting from a larger number.

Concerning the questionnaires sent out, one hundred of them were mailed to the hospitals of Louisiana, Mississippi and Texas of one hundred beds and over, and to those of Chicago, Boston and New York. Fifty-one answers have been received. In two hospitals, only medical cases were handled and consequently no inhalant anesthetics were used. This reduces the number to forty-nine.

In eighteen of these ethylene was not used at all because of increased fire risk, explosiveness and cost. The charity institutions of the large cities seldom use ethylene. In Cook County of Chicago and Bellevue of New York and New York City Children's Hospital it is not used at all. It is very pleasing to note, however, that in our own Charity Hospital at New Orleans ethylene is given to all patients requiring this anesthetic, numbering 7.7 per cent of the total anesthetics given. Ethylene and oxygen with ether is given in .8 of 1 per cent. Comparing these with the statistics of the large institutions of charity of North America this is a most exceptional and creditable showing.

In thirty-one hospitals where this anesthetic is employed there have been no immediate deaths. In two hospitals an indirect death had probably resulted from ethylene; the reason in one instance is not given, in the other it was the result of an explosion.

Of the forty-two private institutions, fourteen use ethylene and oxygen as the anesthetic of choice in general surgery, seven of these being hospitals ranging from 250 to 500 beds; notably, Michael

HOSPITAL SUMMARY

Hospital	Beds	I. A.	I. M.	Where used Up. Abd.	Lo. Abd.	J.	Ext.	Not Used	Obstetrics	% C_2H_4	% Ether	Anesthetic of choice Surgery	Obstetrics
N. E. Deaconess Boston	175	No	No	Rarely	Rarely	Yes	Yes	E. N. and T. Cautery G. U.	.....		.....	Ether	.....
Fifth Ave., N. Y.	295	No	No	Occasionally	Occasionally	Yes	Yes	Cautery E. N. and T. X-Ray	Yes	Frequently	Frequently	Ether	Ethylene and Oxygen
Presbyterian, N. Y.	256	No	No	Occasionally	Occasionally	Yes	Yes	Cautery E. N. and T. X-Ray	Yes	Frequently	Frequently	Ether	Ethylene and Oxygen
Post-Graduate Hospital, N. Y.	410	No	No	Occasionally	Occasionally	Yes	Yes	Cautery E. N. and T. X-Ray	Yes	Frequently	Frequently	Ether	Ethylene and Oxygen
St. Luke's, N. Y.	417	No	No	Occasionally	Occasionally	Yes	Yes	Cautery E. N. and T. X-Ray	Yes	Frequently	Frequently	Ether	Ethylene and Oxygen
J. B. Murphy, Chicago	101	No	No	Yes	Yes	Yes	Yes	Cautery Tonsils	Sometimes	35	55	Ethylene and Oxygen	Ethylene and Oxygen
Jackson Park, Chicago	140	No	No	Yes	Yes	Yes	Yes	None	Yes	40	40	Ethylene and Oxygen	Ether
Children's Memorial, Chicago	250	No	No	Yes	Yes	Yes	Yes	Cautery on chest Long op. Respiratory Interference	Yes	15	5	.....	.....
USED LAST YEAR	DISCARDED THIS YEAR			BECAUSE OF EXPLOSIVENESS.		ALSO	DUE	TO INCREASED	FIRE	RISK. LAST	YEAR'S REPORT FOLLOWS:		
Lenox Hill, N. Y.	345	No	No	Yes	Yes	Yes	Yes	Open mouth op. Cautery	Yes	50		N_2O, Oxygen and Ether	N_2O, Oxygen and Ether
Mercy Hospital, Chicago	400	No	No	Yes	Yes	Yes	Yes	Used in all cases	Yes	15	5	Ether	Ether
Alexian Bros., Chicago	300	No	No	In some cases	Yes	Yes	Yes	Tonsils. Occasionally G. B.	.....	50	45	Ethylene and Oxygen	.....
Harris Hospital, Fort Worth	100	No	No	ETHER CHOICE					No	10	10	Ether	Ether

HOSPITAL SUMMARY

Hospital	Beds	I. A.	I. M.	Where used Up. Abd.	Lo. Abd.	J.	Ext.	Not Used	Obstetrics	% C_2H_4	% Ether	Anesthetic of choice	
												Surgery	Obstetrics
Presbyterian, N. Y.	256	No	Several pneumonias	Occasionally	Frequently	Rule	Rule	Hemorrhoids. Gastric and neck work	.. ..	40	60	Ethylene and Oxygen	Ethylene and Oxygen
Baylor U. Hospital, Dallas	412	No	No	Yes	Yes	Yes	Yes	Only where cautery nearer face than hemorrhoids	Only in repair	85	50	Ethylene and Oxygen	Nitrous Oxide and Oxygen
Hotel Dieu, New Orleans	269	No	No	Yes	Yes	Yes	Yes	Cautery excision. X-Ray room	Yes	75	2	Ethylene and Oxygen	Ethylene and Oxygen
N. Louisiana Sanitarium, Shreveport, La.	100	No	No	Yes	Yes	Yes	Yes	None	No	10	70	Ethylene and Oxygen	Nitrous Oxide Oxygen
St. Luke's, N. Y.	417	No	No		Yes	Yes	Yes	Brain, N. and T. Splenectomies long hip manipulations	.....	30	10	N_2O, Oxygen and Ether	.....
Hotel Dieu, Beaumont, Tex.	175	No	No	Yes	Yes	Yes	Yes	Cautery within 3 ft. of mask	Yes	16	4	Ethylene and Oxygen	Ethylene and Oxygen
Eye, Ear, Nose and Throat, New Orleans	66	No						Cautery. Eye.	.....	10		Ether	.....
Our Lady of the Lake, Baton Rouge, La.	112	No	No	Yes	Yes	Yes	Yes	None	Yes	50	25	Ethylene and Oxygen	Ethylene and Oxygen
Michael Reese, Chicago	489	No	No	Yes	Yes	Yes	Yes	Electrical cautery, high frequency	Yes	75	25	Ethylene and Oxygen	Ethylene and Oxygen
Baptist Hospital, Abelene, Tex.	81	No	No	Rarely	Yes	Yes	Yes	Cautery Tonsils	Yes	50	40	Ethylene and Oxygen	N_2O, Oxygen and Ether

HOSPITAL SUMMARY

Hospital	Beds	I. A.	I. M.	Where used Up. Abd.	Lo. Abd.	J.	Ext.	Not Used	Obstetrics	% C_2H_4	% Ether	Anesthetic of choice Surgery	Anesthetic of choice Obstetrics
Lying-In Hospital, Chicago	260	No	No	.....	Yes	.....	.....	None	Yes	50	12½	.....	Ethylene and Oxygen
Mother Calireni Memorial, Chicago	165	No	No	Yes with Ether	Yes with Ether	Yes	Yes	Cautery. N. T. and Mouth cases	Yes	25	50	Ethylene, Oxygen and Ether	Ethylene and Oxygen
Santa Rosa, San Antonio, Texas	321	No	No	Yes with Ether	Yes with Ether	Yes	Yes	Cautery	Yes	.....	.....	Ether	Chloroform
Augustana Hosp. Chicago	276	No	No	Yes	Yes	Yes	Yes	None	No	25	25	Ethylene and Oxygen	N_2O, Oxygen and Ether
St. Francis, Monroe, La.	125	No	No	Yes	Yes	Yes	Yes	None	No	10	5	N_2O, Oxygen and Ether	N_2O, Oxygen and Ether
Hospital by T. Abromson	100	No	No	Yes	Yes	Yes	Yes	Cautery	Yes	55	10	Ethylene and Oxygen	Ethylene and Oxygen
Charity Hospital, N. O., La.	1600	No	No	Yes	Yes	Yes	Yes	Cautery	Yes	7.7	.8 of 1	Ethylene and Oxygen	Ethylene and Oxygen

FOOT NOTE: In order to save space the following hospitals were deleted.

St. Anthony's of Chicago; Peter Bent Brigham of Boston; Harris Hospital, Fort Worth; New York City's Children; Cambridge Hospital, Masschusetts; Cook County, Chicago; Englewood, Chicago; Bellevue, New York; Southern Pacific, Houston; Beth Israel of New York; St. Mark's, New York; Woman's Hospital, New York; South Mississippi Hospital, Hattiesburg; City Hospital, New Orleans; Baptist Hospital, Alexandria; F. E. Willard Hospital, Chicago; Long Island Hospital, Boston; Massachusetts General Hospital, Boston; Vicksburg Sanitarium, Vicksburg. These hospitals had either never used it on account of explosiveness, or have used it too short a time to supply statistics. In several of the hospitals the note was made that the use of ethylene has been discontinued.

The column in the author's chart headed "contra-indications" was also deleted. Most of the hospitals said that there were no contra-indications to the use of ethylene. A few mentioned "when cautery is used" as a contra-indication.

Abbreviation "J" refers to joints; "Ext." to extremities.

"I. A." refers to immediate mortality; "I. M." to indirect mortality.

Reese of Chicago, 489 beds, Augustana Hospital of Chicago, 276 beds, and the Baylor University Hospital of Dallas, Texas, 412 beds.

This list includes Presbyterian Hospital of New York City, 256 beds, Fifth Avenue Hospital of New York City, 295 beds, Children's Memorial of Chicago, 250 beds, Mercy Hospital, Chicago, 400 beds, Alexian Brothers, Chicago, 300 beds, Baylor University Hospital, 412 beds, St. Luke's Hospital, New York City, 417 beds, Michael Reese Memorial Hospital, Chicago, 489 beds, Augustana Hospital, Chicago, 276 beds, and Hotel Dieu, New Orleans, 269 beds.

In only three hospitals of 250 beds or over was it not used, viz., Woman's Hospital of New York City, 260 beds, Lenox Hill Hospital, New York, 345 beds, and Harlem Hospital, New York City, 312 beds.

CONTRAINDICATIONS.

In all of the hospitals where obstetrical patients are given ethylene no contraindications are recorded against its use. In the Lying-in Hospital of Chicago and thirteen of the other hospitals from which statistics were received ethylene and oxygen anesthesia is considered the one of choice for obstetrics.

In surgery, of the ethylene users, most of the hospitals declared no contraindications to exist as to its use. Nearly all have combined it with ether in upper abdominal surgery. Nearly all prohibit the use of the cautery. Brain surgery, ear, nose and throat surgery and surgery of infants are often mentioned among the contraindications.

The total number of times ethylene has been administered in these hospitals must number over 100,000 times. Not one immediate death is reported, and a question mark is placed after one or two indirect ones. Can we say more of ether? Can we say more of any other inhalant anesthetics?

The static spark is not present under the normal atmospheric conditions of New Orleans with its high humidity. Explosions of an inflammable gas could not easily be produced from this source. The opposite condition prevails in the cold climate and low humidity of the North, East and West. A spark one inch in length is formed by simply inserting a metal key into the lock on the door.

Having now presented the status of ethylene anesthesia as I view it, the following conclusions seem fair and reasonably correct:

1. We do not pretend that ethylene will replace the local, regional, spinal and rectal anesthesia, for in our own service we employ the other anesthesias several hundred times a year.

2. We do believe, however, that ethylene and oxygen anesthesia is the inhalant anesthetic of choice for general surgery and normal obstetrics.

3. In operations requiring great relaxation at times other aids have to be supplemented; *e. g.*, local injection of the muscles and peritoneum and, in a few instances, a small amount of ether is necessary.

4. The surgeon and anesthetist must at all times work in complete co-operation and occasionally surgical technic, in particular the using of retractors, packing and the method of closure must be modified to meet anesthetic requirements.

5. In a small percentage of cases it is not the general anesthetic of choice; *e. g.*, brain surgery, the presence of the cautery, and in the roentgen-ray room.

6. Existing kidney disease is sometimes aggravated by the anesthetic, and likewise pulmonary infection.

7. In the South especially, where the gas can be administered by competent anesthetists, employing new and standard equipment, ethylene and oxygen anesthesia

is destined to be, if it is not already, the first anesthetic of choice for inhalant narcosis.

Before concluding I wish to read a letter from Dr. George Crile of Cleveland which I received too late to include in this report:

"Dear Dr. Nix:

I am interested in your questionnaire enclosed in your letter of March 4 which I cannot answer as we do not use ethylene anesthesia. We are still placing our main dependence upon nitrous oxid-oxygen analgesia and local anesthesia and upon spinal and sacral anesthesia in suitable cases.

Very sincerely yours,

GEO. CRILE."

If this can be said of nitrous oxid-oxygen analgesia and local anesthesia, it is my opinion that the same and more can be said with far less fear of contradiction if we substitute ethylene and oxygen for nitrous oxid-oxygen in Dr. Crile's letter.

I wish to thank the managements of the hospitals for their promptness and frankness in answering the questionnaires. I am especially indebted to Dr. Arno Luckhardt and Dr. Johnny Lundy for the assistance they gave on so many occasions in answering the questions I put to them.

For the giving of my anesthetics I express appreciation to Miss Agnes Grillet and the staff anesthetists at Hotel Dieu, New Orleans.

Last, but not least, I am grateful to the chairman of the section on Surgery and to the Louisiana State Medical Society for the privilege of presenting this paper.

DISCUSSION.

Dr. Jerome Landry (New Orleans): Luckhardt and Carter, in 1922, demonstrated the possibility of relieving sensibility to pain by means of ethylene gas, a substance long used as illuminating gas in railroad coaches. This was made possible by removing impurities, such as carbon monoxide, a deadly poison, and by the addition of oxygen to the ethylene. To employ anything but the refined and carefully tested gas would be inviting disaster.

In Pittsburg not long ago a well known surgeon performed a major operation using ethylene gas, and had used it many times before, lost his patient, the result of the anesthesia. Next day another such death occurred. This particular product showed to contain seven parts of CO in a 1000 ethylene. This is merely mentioned to emphasize the necessity of using pure gas. On the other hand one institution alone reports 20,000 or more anesthetics without a fatality. Ranson and Cabot of Ann Arbor, Michigan, 11,600. Allen and Murray of Detroit, 2,750 and here, Dr. Nix reports his large number showing the safety of this agent.

The necessity of using an agent which inhibits cellular activity complicates the question of narcosis. We are compelled to lessen the durable lesions from their use as much as possible.

The chief anesthetics ether, nitrous oxide, ethylene-oxygen, are tried anesthetics and have been found satisfactory to certain degrees. These agents may and do give rise to lasting alterations in the cells, particularly of the liver and kidney. Nitrous oxide is a satisfactory anesthetic. Its disadvantage has been that the patient must be kept on the verge of asphyxia constantly and it is not apt to produce muscular relaxation. Ethylene has all the advantages to a more or less degree of the above mentioned, and is placed beteween ether and nitrous oxide. It gives a greater relaxation than nitrous oxide and avoids the objectionable asphyxia.

I may summarize the question as follows: Ethylene-oxygen anesthesia owes its popularity to a number of desirable properties, all of which are possessed by no one of the other available anesthetic agents. Ethylene causes an anesthetic state almost as profound as ether and more profound than nitrous oxide. Because of this fact the relaxation of the patient is more complete than with nitrous oxide, allowing more accurate and careful surgical technic. Since the relaxation is almost as profound as when ether is used, but without the disagreeable and prolonged subsequent ether sickness, ethylene is preferred to ether when the utmost relaxation is not required. Patients have been anesthetized for as long as 5.5 hours, with a maximum period of nausea and vomiting of one hour directly attributable to the anesthetic. In spite of the profound anesthetic state effected by ethylene administered in combination with oxygen, patients return to the conscious state within 2 to 3 minutes usually following removal of the mask irrespective of the duration of the surgical anesthetic state. Of a gaseous

nature and given in combination with oxygen as is nitrous oxide, ethylene, like nitrous oxide, is non-irritant to the respiratory passages, and is therefore not contra-indicted, as would be ether, in patients who at the time of operation suffer from an acute upper respiratory infection, acute bronchitis, or pulmonary tuberculosis; ether because of its irritant properties may predispose patients having these repiratory infections to a fatal post-operative pneumonia. Since any given surgical anesthetic state can be induced with more oxygen than is possible under nitrous oxide, general asphyxia of the cells is avoided, with its unfavorable consequences. Incidentally, the surgical and anesthetic sleep under ethylene is tranquil and more nearly like the normal sleep than is the case under any other anesthetic agent. Salivation and perspiration are less marked under nitrous oxide than under ether, and least under ethylene. Not only are the body fluids conserved as a result (for the patient may not be allowed to take fluids for some time after recovery from the anesthetic) but the absence of chilling resulting from the perspiration minimizes the danger of a post-operative pneumonia.

The subject of explosibility is a real source of danger and has been taken up by Dr. Nix and as he states if proper precautions this is not likely to occur. I would like to mention here an explosion of ether-opiates, I believe should be given not only for the purpose of helping the anesthesia but to relieve after pain on account of the rapid regaining of consciousness following this anesthetic. The odor is not contra-indicated.

Satisfactory relaxation can be maintained in most cases with a small amount of ether or local or regional anesthesia. The gas does not act as a cardiac or respiratory depressant unless pushed to profound narcosis. Ethylene can be used equally as well in the very young or the aged and debilitated. Repeated use at frequent intervals does not decrease its potency, nor does it increase the post anesthetic nausea and vomiting. It is for this reason that makes it an ideal anesthetic for normal obstetrics. It is not an anesthetic which can be employed except where a trained anesthetic is at hand and its cumbersome apparatus makes it impracticable for home work. One of the nice features of this anesthetic is to see your patient put to sleep in two or three minutes without any struggle and at the completion of your operation and removal of the mask he is awake at once. The cost is an item to be considered. The average cost is about 7½c per minute. I want to thank Dr. Nix for asking me to open this discussion and to congratulate him upon the success he has had in the extensive use in this agent.

Dr. A. Oschner (New Orleans): I want to arise concerning the technic of inhalation anesthesia. The remarks Dr. Nix has made concerning the large quantities of ethylene that have been used within the last year prompt me to make the suggestion.

Dr. Ralph Waters, a number of years ago at the University of Wisconsin, devised an apparatus, the idea of which he got from the physiologists, which consists of a soda lime tank which he puts into the closed circulation. The soda lime will absorb the carbon dioxid, and it becomes necessary for the anesthetist to add only oxygen to his anesthetic. After anesthesia has been obtained it is unnecessary to use any more anesthetic gas. After about fifteen minutes anesthesia, which, according to Dr. Waters, amounts to about twenty-five cents worth of gas, he can run along for one and one-half to two hours without any more ethylene. The only thing which he does is to remove the carbon dioxid and add oxygen.

Dr. Waters introduced this method at the University of Wisconsin Hospital in Madison, and has saved the hospital from fifteen to thirty dollars a day in the price of ethylene. Not only is it a great economic saving, but a great saving as far as the surgeon is concerned. One can go into an operating room in which this anesthetic is being given and smell no ethylene. The possibility of explosion from cautery is also cut down. We never hesitated using a cautery with ethylene provided we didn't use it around the face. It is an entirely closed circuit. It is a very simple principle. The carbon dioxid is removed and the oxygen added, the ethylene remaining constant.

Dr. E. L. King (New Orleans): I merely want to say a word about the use of ethylene in obstetrics. I passed through the stage of ether and nitrous oxid, but since ethylene has come in the field I have found it is about the best obstetrical anesthetic. I would go further than Dr. Nix and Dr. Landry and say it is not only good for normal obstetrics, but for most abnormal work as well. I have used it in many cases of forceps, in Caesarean sections, and in several instances where I have done hysterectomy for ruptured uterus, and have found it exceedingly valuable. I have also used it in ectopic pregnancy without the addition of ether.

It does not give quite as much relaxation as ether, but that does not concern us when it comes to the question of Caesarean section or the average case of ectopic pregnancy. For podalic version it does not give enough relaxation, and then we fall back on ether, or fall back on the advice of our Dr. E. S. Lewis, or Dr. Potter of Buffalo, and use chloroform.

I have also used ethylene in breech extractions, and particularly in normal obstetrics. I have

given it in many cases over a period of several hours, giving the anesthetic intermittently, of course, with the pains—I have not hesitated to give it for three or four hours, and sometimes five hours, in a normal case, particularly in a difficult case as, for example, an obstinate posterior position in a primipara. It has worked very well.

One point I have noticed, and that is it gives a slow pulse on the part of the mother. That worried me at first, but I have since learned that this does not signify anything abnormal.

Another charge has been brought against ethylene in obstetrics—I hear no more of it now: It used to be said that it increased postpartum bleeding. I have not found that to be true. We do get postpartum bleeding once in a while, but I have not seen it increased by the use of ethylene.

Another thing I noticed (it may not be correct), but it appears to me to be a fact that it does not influence a baby following Caesarean section as much as ether. The babies generally cry much quicker and are much easier to resuscitate. As far as concerns its use in normal obstetrics, or with low forceps, I have not been able to see that the anesthetic has affected the baby.

Dr. Preston M. Hickey (Ann Arbor, Michigan): I should just like to add a postscript to the quotation from Dr. Cabot in which he speaks of 33,000 anesthesias. This was written before we had a bad explosion. Since that time ethylene has not been used in the University Hospital at Ann Arbor, Michigan.

Dr. M. J. Gelpi (New Orleans): I do not think this splendid paper should be allowed to pass without a little further discussion.

While I am an advocate and a user of ethylene gas, I don't think the idea should be allowed to prevail that it is the ideal anesthetic by any means. I don't think we have come to the point where we can talk about any anesthetic as being ideal, unless, of course, you can say that it has no objections. That certainly can't be said about ethylene.

So far as the explosibility is concerned, I am frank to confess I always have a certain amount of apprehension when an ethylene tank is in my room. Furthermore, I always feel restricted in my work to a certain degree, many times, because I can't use the cautery. Every now and then something will turn up that makes you feel you want to use a cautery, and I feel as though it is better not to do it. I am afraid to do it. I think that is a thing for serious consideration.

In our anesthetic work, we work on the principle that wherever you have to use a large quantity of a powerful drug to produce an effect we find it an advantage to use smaller quantities of several drugs to accomplish our purpose, the idea being you have several means of elimination instead of just one, which seems to be a little safer for the patient. Therefore, we have adopted the Gwathmey and Hooper idea for all our anesthetic work, whether we use ethylene, or ethylene and ether, or ether alone, or with local, in this way: An hour before operation our patients get ten grains of chloretone by mouth, unless the operation is to be on the stomach when we give this chloretone by the rectum. At the same time, an hour before operation, we give a synergistic hypodermic of morphin, usually an eighth, sometimes a sixth for a large patient, with two c. c's. of 50 per cent magnesium sulphate injected deeply through iodin. In fifteen minutes we repeat this, and then the patient comes down for operation in a wonderful mood for the general anesthetic, always requiring less of the general anesthetic.

Dr. Ward and myself have checked up on this thing pretty carefully at the hospital, and we have found that in some abdominal operations with ether alone we have run as low as three ounces. That is something to be thought of with your ethylene as well as with all general anesthetics.

So far as relaxation is concerned. I haven't been as fortunate as Dr. Nix, and perhaps I am a little finicky as regards relaxation. But in nearly all of our abdominal work we have found it necessary to use some ether.

Dr. J. T. Nix (closing): I have nothing to say, except to thank the gentlemen for their discussion of my paper.

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SPLANCHNIC ANALGESIA.*

ITS CONDUCT AND EFFICIENCY IN SURGERY OF THE UPPER ABDOMEN.

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NEW ORLEANS.

In 1913 Kappis, during animal experimentation, learned that section of the splanchnic nerves caused loss of pain sensation in the stomach, spleen, bile ducts, and upper portion of the small intestines. During the same year he injected for anesthethic purposes the splanchnics as they enter the semilunar ganglia and his results created considerable interest and caused suggestions for additional methods of producing splanchnic analgesia.

This term implies the blocking, with an anesthetic solution, of the splanchnic nerves, by infiltration of the retroperitoneal tissue about the solar plexus, thus altering the pain sensation normally produced by manipulation of the upper abdominal organs under splanchnic control.

The splanchnics are three in number, situated on either side; the greater, lesser and least splanchnic nerves. The greater splanchnic nerve is formed on the lateral side of the eleventh dorsal vertebrae by roots from the middle thoracic sympathetic ganglia, receiving fibers from the fifth to tenth thoracic nerves by way of communicating rami. It passes through the crus of the diaphragm into the abdomen to join the corresponding semilunar ganglion. The lesser splanchnic nerve arises from the lower thoracic sympathetic ganglia receiving branches from the tenth to twelfth dorsal nerves and enters the abdomen in company with and lateral to the great splanchnic nerve, where it, too, joins the corresponding semilunar ganglion, also giving fibers to the renal and celiac plexuses. The least splanchnic nerve is formed by a branch from the twelfth and may accompany or be incorporated in the lesser splanchnic nerve.

The semilunar ganglia are two in number situated one to either side of the median line and resting opposite the first lumbar vertebrae immediately above the pancreas. They are partly covered by the vena cava on the right and pancreas on the left.

There have been recommended four general methods of inducing splanchnic analgesia: Two by the anterior and two by the posterior routes. The anterior procedures are those of Braun and of Wendling. The posterior procedures are those of Kappis and of Roussiel. That of Roussiel is unnecessary while that of Wendling is foolhardy and should not be attempted. These are only mentioned in passing.

Braun's anterior splanchnic analgesia is accomplished after laparotomy by ventral abdominal block. The liver is gently elevated by a retractor in the hands of an assistant. The operator with the left hand retracts the stomach downward and to the left at the same time passing the left index finger above the lesser gastric curvature, into the space between the aorta on the left and the vena cava on the right, gaining contact with the anterior surface of the body of the first lumbar vertebrae.

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The forceful pulsations of the aorta are easily recognized and this structure is pushed to the left, while the vena cava offers little resistance and collapses beneath the finger. The aorta is quite resistant and while it may not be easily punctured such an accident is possible and should be guarded against. The specially prepared needle is passed along the radial side of the left index finger until its tip is reached, when its point is introduced with a quick thrust into the retroperitoneal space, striking the body of the first lumbar vertebrae. The finger is withdrawn, aspiration performed and should blood be obtained, the needle should be withdrawn and compression applied for a few moments. The procedure may now be repeated and when it is determined that the needle is properly placed, injection is made of from 50 cc. to 70 cc. of ½ per cent novocain or procain solution.

This procedure is quite efficacious and has a wide field of application. It may and has been used in mid-epigastric and right rectus incisions. However, in cases of massed adhesions caused from pericystic inflammation or subacute perforating ulcer, access to the splanchnic area is difficult and not infrequently impossible.

The posterior injection after the Kappis procedure, modified by making only one puncture to either side of the vertebral column, is the one most generally employed by the author and it has been found to be the most universally applicable. This injection is made by selecting a point below the inferior margin of the last rib four fingers' breadth lateral to the mid-dorsal plane. This is normally opposite the spine of the first lumbar vertebrae. Here an intradermal wheal is raised and with the patient in either the lateral or sitting position, a 12 cm. 18 or 19 gauge needle with a short bevel is introduced so as to make an angle of 30° with the saggittal plane, passing inward, upward and medially toward the first lumbar vertebra. As the needle point reaches the vertebra at the junction of its lateral and ventral surfaces it is in close association with the splanchnic nerves; so long as the needle is not introduced more than an additional centimeter there is no danger of injuring the structures of the retroperitoneal space. An injection is made of 20 to 40 cc. of ½ per cent novocain or procain solution. A similar procedure on the opposite side accomplishes analgesia of all viscera under splanchnic control.

It is now essential that laparotomy be performed under ventral block analgesia since the anterior abdominal wall is not under the control of the splanchnics but is innervated by the spinal nerves themselves. This is effected by introducing 10 cc. of ½ per cent procain within the lateral edge of rectus sheaths between the serrations of the muscle.

All procedures governing any form of local or regional analgesia must be observed. The patient should have a preliminary hypodermic of pantopon or morphin. The patient must be impressed with the difference between touch sensations and pain sensations, even to the point of actual demonstration, for he will experience frequently the sense of touch or pressure while he should not have pain. This explanation and understanding alone will be of the most valuable aid to both patient and operator.

The anterior method is associated with some degree of discomfort as the finger is introduced into the splanchnic area, but immediately the injection is made there is instant and complete relief. This procedure is carried out under the guidance of the sight and touch; it also is accompanied by some possibility of danger—such as veni puncture or intravenous injection. However, with reasonable care this should not occur.

The posterior method as outlined is relatively free from danger unless one becomes ruthless in the introduction of the needle. There is little or no pain experienced during puncture but this may be eliminated by the deposition of a few drops

of anesthetic solution along the route of the needle. The posterior injection may be utilized for exploration of the upper abdomen where other than epigastric incisions are employed.

This type of analgesia has been employed by the author for the past five years and it has been one hundred per cent satisfactory for all surgical procedures in the upper abdomen. There is a complete absence of pain, perfect relaxation of the abdominal musculature associated with that most desirable phenomenon, an absence of intra-abdominal pressure evidenced by the willingness of the viscera to remain within the abdomen and not present themselves in the operative field or wound. There may be a drop in blood pressure of 25 to 30 m.m. with associated symptoms but a preliminary injection of ephedrin sulphate readily compensates for this. The patient may occasionally experience a feeling of nausea or even vomit. The post-operative course of a patient operated by this procedure is strikingly free from nausea, vomiting, or pain, and the need for narcotics is rare. There has been no case of abdominal distention requiring treatment for its relief.

CONCLUSIONS

1. Splanchnic analgesia is accomplished by the introduction into the retroperitoneal space opposite the first lumbar vertebrae sufficient anesthetic solution to saturate the splanchnic nerves and semilunar ganglia.

2. It is thoroughly efficacious for all operations upon the stomach, duodenum, spleen, pancreas, gall-bladder and its ducts, the upper third of the small intestines and the transverse colon.

3. Its introduction is simple. The analgesia is absolute, relaxation is complete, and intra-abdominal pressure is negative.

4. It is dependable and its duration is from two to three hours.

5. The post-operative course presents no alarming or distressing symptoms. There is rarely nausea, vomiting, pain, or use of narcotics. Abdominal distention has been absent.

6. Braun's anterior injection after laparotomy is practical, and efficacious, but limited in its use. The Irwin-Kappis posterior procedure is the most generally applicable and the simplest of application.

7. Splanchnic analgesia is the one ideal for surgical procedure of the upper abdomen.

DISCUSSION.

Dr. Maurice J. Gelpi (New Orleans): Dr. Irwin does his local work with so much ease and facility, and so beautifully, that I am not surprised at his continued enthusiasm for this wonderful method of producing anesthesia.

I had occasion to discuss this subject in the Orleans Parish Society a few months ago. I still feel pretty much the same about the subject as I did then. I am convinced that splanchnic analgesia has a definite field of usefulness. In my opinion, it produces the most marvelous relaxation in the abdomen of any anesthesia I know of.

At the time we discussed this before, Dr. Ochsner made the point that this method of anesthesia was not free from danger. He is certainly correct in the matter, and yet with proper precautions, and with the use, particularly, of the Dunham needle for the anterior injection the thing can be made certainly reasonably safe if the individual who is doing it has taken the trouble to get little practice in introducing the anesthesia.

While I am convinced that this method of anesthesia lends itself best for gastric surgery and intestinal surgery, we have been able to do work on the stomach, resections of the little bowel, explorations, cholecystectomies, and work of that character, with absolute satisfaction.

As regards the question of whether we should use the anterior method or the posterior method, as far as I am concerned I am still inclined to the anterior route where the conditions are favorable for this injection. For a long while I didn't attempt the posterior route except as Matas does it, and where we have used it we found it very satisfactory.

We have used it a number of times in order to explore. Where we felt there was trouble on the right side, we have done a posterior injection on the right side, blocked it anteriorly, and then with a careful anesthesia of the peritoneum, which is always very important, we have been able to ex-

plore the gall-bladder, duodenum and the pylorus very satisfactorily.

I want to call your attention here, again, to the importance of the use of something to put your patient in the proper mood for this anesthesia. Your patient must be prepared in advance by explaining what is going to happen, and we found that in trying to supplement the absence of what Dr. Matas calls the luxury of going to sleep the Gwathmey idea has served very well. We always give the chloretone one hour before, and at the same time give two cc.'s of 50 per cent of magnesium sulphate in morphin. We repeat that in fifteen minutes. That brings the patient down in a mood where the rattling of instruments doesn't disturb him, and gives you a much better chance to do your local work.

I believe while the tendency is for this type of anesthesia to be supplemented by the revival of interest in spinal, there is still a definite field of usefulness for splanchnic, and I feel that anyone who is doing much abdominal work should be prepared to do this work either by the anterior route or the posterior.

Dr. Emmett Irwin (New Orleans): I want to thank Dr. Gelpi for his very kind remarks.

I am glad he mentioned the question of preparing the patient beforehand. In all types of local work the patient should be made to understand that he is going to feel. Never promise a patient that he won't feel what you are doing. Many a local has been spoiled by promising the patient that he would not feel what you are going to do. He will feel, but he should not have the pain.

Dr. Irwin showed slides.

Dr. Irwin: The remarkable thing about the splanchnic analgesia is the great relaxation that we have. The negative intra-abdominal pressure is evidenced by the willingness of the viscera to remain within the abdominal cavity and not present themselves in the wound. You don't have to fight with the viscera all the time to keep them out of the way.

There is scarcely ever postoperative nausea or vomiting. There is no abdominal distention following this type of anesthesia, and there is rarely a case in which a postoperative narcotic is necessary. For that reason, I think that type of analgesia is about the most ideal that we know of at the present time for surgical procedures in the upper abdomen. It controls the stomach, gall-bladder, biliary passages, pancreas, kidneys, spleen, upper intestinal tract and the transverse colon.

Thank you very much.

SPINAL ANESTHESIA.†

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For more than three decades spinal anesthesia has run the gamut of recurring popularity and disfavor. At the present time the pendulum is swinging toward approval, and it appears that spinal anesthesia may once more be in vogue. This degree of favor is due, in part, to refinements of technic and to the availability of new drugs. But more especially its current widespread application is due to a more thorough understanding of the reactive phenomena accompanying spinal anesthesia. Knowledge of a procedure is axiomatically a prime requisite for its correct employment. This peculiarly applies to spinal anesthesia. Undoubtedly its past disrepute was largely justified because of untoward results obtained by those whose haste to use a new method curtailed their complete understanding of the possible undesirable reactions and complications. Further, it is worthy of note that those who now most ardently advocate spinal anesthesia have the best knowledge of its limitations and are most conservative as to its indications.

In 1862 Schraff found that cocain possessed local analgesic properties, and in 1884 Koller suggested its employment for surgical purposes. In 1885 Corning, experimenting with cocain, conceived the idea that if injection were made in close proximity to the spinal cord, anesthesia could be produced by the drug's entering into the circulation about the cord. This was, of course, a misconception, but in attempting to inject the solution of cocain near the cord in the lumbar region, he unintentionally pushed the needle into the subarachnoid space and induced the first spinal analgesia. Corning suggested the surgical

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applicability of irrigating the cauda equina with anesthetic fluids, but no one seemed to be impressed by his suggestion until Bier demonstrated its entire feasibility in a most dramatic way when he observed the effects of analgesia induced, by this method, upon himself, his assistants, and six patients. Bier's paper, published in 1899, established the surgical application of spinal anesthesia, and very soon many surgeons throughout the world, especially in America and France, adopted the method. On December 10, 1899 Dr. Rudolph Matas successfully performed a hemorrhoidectomy with spinal analgesia induced by injecting a 1 per cent solution of cocain into the subarachnoid space at the level of the fourth lumbar interspace. A short account of this experience, published in December, 1899, was the first American report of spinal anesthesia. The procedure was soon widely acclaimed, and surgeons hastened to attempt all types of operations with spinal anesthesia. Among those best fitted to judge, Bier, especially, protested against such recklessness, and insisted that the method would not be safe until less toxic drugs could be found and until improvements in technic could prevent the dangerous accompanying phenomena. However, no one heeded these warnings, and any semblance of conservatism was soon lost, and radical procedures were in vogue. Morton, bolder than the rest, advocated the use of spinal analgesia for operations upon all parts of the body. No doubt his work gave a justification for the incorrect substitution of the term "anesthesia" for "analgesia." Tragic fatalities soon curtailed the method's popularity, but later, with the advent of new drugs, the then dying glow of enthusiasm again burst into flame. In a few instances this enthusiasm became permanent, but in far more cases it was as transitory as it had been previously. Those who continued to use spinal analgesia, at first, had rather discouraging results, but as they grew to understand more of its limitations their results began steadily to improve. We are now vested with their accumulated experience, and, in addition, are armed with new drugs of proven therapeutic value.

The advantages of spinal analgesia have long been known, and the surgeon would gladly have availed himself of them had not his fear of the procedure rightly inhibited him. Spinal analgesia redoubles the surgeon's efficiency by producing perfect relaxation, entire freedom from pain, augmented peristalsis, and contracted intestines that do not protrude through the abdominal incision. The method entails a technic over which he can have complete control and supervision. As his skill in its employment increases he attains a finesse unequalled in the realm of anesthesia. Absence of nausea and vomiting makes possible early ingestion of food, thereby tending to prevent acidosis. Paralysis of the gastro-intestinal tract, always an annoying, and not infrequently disastrous, postoperative complication, is rarely seen after spinal analgesia and then only in a comparatively mild form. In no other way can so small a dose of anesthetic drug produce such extensive analgesia with so little systemic toxemia. If any depression from the anesthetic does occur, its onset is within a few minutes after the induction, and is well borne because the patient has not been subjected to operative shock. This is in contrast to the accumulative depression accompanying a long inhalation anesthesia.

However, we are reminded that even in anesthesia Utopia is still around the corner. Spinal analgesia has compensating disadvantages. It is a highly technical method; lack of skill in administration is more obvious than in the use of ether, and lack of trained supervision during the period of analgesia may prove extremely disastrous.

It has limitations, and with no other anesthethic must indications be so carefully weighed. One obvious disadvantage is that once the estimated dose of the drug has been injected and the operation started, if,

for some reason, the operation is prolonged beyond the anticipated time, nothing can be done to lengthen the duration of the anesthetic, and one is obliged to resort to inhalation anesthesia or give a second spinal injection. However, analgesia can safely be procured for one and one-half or two hours, which length of time should allow of all but extremely unusual abdominal operations. A few patients vomit, but in the absence of such factors as pyschic influence or idiosyncrasy to morphin (given pre-operatively), this is evidence of high diffusion of the drug, and is accompanied by pallor, sweating, syncope, and air-hunger. There is no reason for such an untoward reaction to occur if the analgesia is properly performed. There is, of course, the possibility of cord injury. This, indeed, is remote, and should never occur if low punctures are made, and short beveled needles of small caliber are used skillfully.

In the many thousands of cases reported by both careless and careful surgeons there have been a few instances of ocular paralysis, occurring no doubt from a high diffussion of too large a dose of anesthetic drug. In spite of this unwarranted complication, none of the palsies reported have been permanent.

It is not my purpose to compare these disadvantages with the known shortcomings of inhalation anesthesia. However, I think that it is fair to mention that comparable relaxation can be obtained only by deep ether anesthesia, which carries the well-known predisposition to surgical shock, post-operative lung complications, and damage to the parenchymatous organs.

Spinal analgesia can safely be used for all operations below the diaphragm, with but few, yet very definite, exceptions. Until recently it has been thought that this form of anesthesia was suitable only for "bad risk" cases, whereas now many surgeons realize that it is an ideal anesthetic for the young robust individual, and is contraindicated in the moribund. Patients with hypertension are difficult problems for any type of anesthesia. They respond very favorably to spinal analgesia. However, it is justifiable to emphasize the point that a sudden reduction of the systolic pressure is even more poorly borne by these patients than a similar decrease would be tolerated by the normal individual. Low blood pressure was formerly the classical contraindication to spinal analgesia, but, with properly controlled diffusion of the anesthetic drug and appropriate doses of ephedrin, this should not prove an absolute contraindication, unless, of course, the hypotension is due to shock or hemorrhage. The author has used spinal analgesia in many cases of low blood pressure, three of which may be cited as having a marked degree of hypotension. The first case was that of an anemic male with a systolic blood pressure of 84, in which a perinephritic abscess was successfully explored and drained. The second was an anemic male with an undetermined type of enteritis and partial intestinal obstruction with a systolic reading of 82, in which case high spinal analgesia was successfully tolerated for an exploratory laparotomy and enterostomy. The third was a female with Banti's disease, having a systolic reading of 78, in which case a splenectomy was successfully performed. It would seem then that hypotension *per se* is not an absolute contraindication to properly controlled spinal analgesia. Cases with marked renal damage tolerate spinal analgesia better than inhalation anesthesia. Ether is known to have a definite deleterious effect on renal tissue and even patients subjected to ethylene or nitrous oxid anesthesia occasionally have albumin and casts in the urine after operation.

Obviously the danger of post-operative inhalation pneumonia is lessened when spinal analgesia is used, especially in any case having an acute respiratory infection. Spinal analgesia will frequently prove ideal in emergency operations when routine preparation of the patient must be minimal. It

will also prove of unusual merit in cases of intestinal obstruction. Here relaxation will allow speedy operation without the usual amount of packing and retracting. The sphincters are relaxed, the intestines contracted, and peristalsis augmented, all of which conditions are greatly to be desired in intestinal obstruction. Spinal anesthesia may be of value in obstetrics, but in this connection many additional factors must be considered, and a wholly different technic is required.

Undoubtedly many of the occasional complications from spinal analgesia which were formerly noted arose from a disregard of the contraindications. Before deciding to use spinal analgesia, it is obviously necessary to take a careful history and to conduct a complete physical examination, for otherwise contraindications can neither be determined nor properly evaluated. The uninitiated may feel a strong urge to employ spinal analgesia in cases of shock, since these cases are, of course, bad risks for any anesthetic. Spinal analgsia is poorly borne by these depressed patients, especially if marked hemorrhage has occurred. However, as most surgeons agree that shock should be relieved, if possible, before operative intervention, this contraindication will seldom be encountered.

Patients with extreme cardiac decompensation, massive pleural effusions, or other conditions markedly decreasing their cardiac and respiratory functions should not be given spinal analgesia. Indeed, when such conditions exist inhalation anesthesia is also contraindicated, and the surgeon is obliged to take recourse to local infiltration or regional nerve blocking.

Any definite central nervous system disease, such as brain or cord tumor, meningitis, or neuro-syphilis, should contraindicate spinal anlagesia. Patients with septicemia should not be subjected to spinal puncture for any reason, as such a procedure would eliminate the protective barrier between the infected blood and the nerve centers. It is, of course evident that if localized suppuration is present at the site of the puncture, the needle should not be introduced.

In spinal analgesia the drug is introduced into the spinal fluid which bathes the intradural tissues, and hence gives the method the distinction of being the only local anesthetic in which the drug is placed in direct contact with the nerve roots instead of the extra-dural nerve fibers. The drug is quickly absorbed by the nerve roots both in the spinal canal and for about two centimeters beyond their exit. However, it is known that the drug does not appreciably impregnate the cord. If the anesthetic agent is held to a restricted area in a concentrated solution, the roots will be deeply penetrated by the drug, and will be thoroughly blocked. If wide diffusion is allowed, it is evident that there will be varying degrees of anesthesia, due to the different concentration of the drug, and most complete blocking will usually occur at the point of injection where the nerve roots are first bathed by the solution. If a large dose of such a diffusable drug is given the concentration of the solution, even some distance from the site of injection, will be sufficient to cause complete intra-spinal blocking of the nerve roots. Therefore, an extensive involvment of the nerve roots may occur and cause distressing or dangerous symptoms, but since the cord itself is not affected by the anesthetizing solutions, there is certainly no basis for the old supposition that the drug affected the vital center in the medulla. The first nerve roots to be affected are the sensory fibers. Their position favors ready contact with the injected anesthetic fluid, and their susceptibility allows quick penetration of the drug. Loss of sensation, therefore, is first noted as the posterior roots cease to conduct impulses. The anterior roots are less susceptible, but are next blocked, though not so completely unless certain drugs are used that have an affinity for the motor roots.

As these roots from the second thoracic to the first lumbar segment contain the white rami communicantes, an anesthesia involving this sector would cause an extensive involvment of the sympathetic system. Cardiac, vasomotor, and respiratory depression would then result. It is, therefore, apparent that the ideal anesthetic should involve as few motor roots as possible and surely leave unaffected fibers not concerned in the operative field. A blocking to the first thoracic segment results in a maximum fall in blood pressure and loss of cardiac augmentation. To extend the anesthesia to the level of the fourth cervical segment is to block the phrenic nerves and cause a diaphragmatic paralysis. We are then confronted with the very critical situation,—respiratory failure. Quite apart from the sympathetic system is the vagus nerve with its extensive distribution to the thorax and abdomen, directly opposing the sympathetics, since it has a depressor action in the thorax, while it supplies motor accelerator impulses to the abdomen. With the loss of sympathetic control to the abdomen and thorax the vagus exerts its impulses uninhibited. The splanchnic vessels dilate rapidly and become a reservoir for a large part of the blood in circulation. As the accelerating stimuli in the thorax are removed by the loss of the sympathetic conductivity the depressive action of the vagus nerve slows the cardiac and respiratory rate. It is apparent, then, that a high extension of the anesthetic is very undesirable.

The systemic toxicity of the drugs used is very slight, since the doses injected are small. However, some of the drugs formerly used were locally toxic in action in that they exerted a profound paralysis, especially of the sympathetic fibers. Complications were frequent. With the newer less toxic drugs this condition is not encountered.

From what has been said, it is evident that vasomotor paralysis occurs to a degree in almost exact ratio to the height of the spinal analgesia. For operations in the upper abdomen it is necessary to induce spinal analgesia to the level of the seventh thoracic segment. No serious consequences should result from this, and if the anesthetic is not allowed to ascend higher the only clinical sign will be a slight lowering of blood pressure, which is readily controlled by appropriate doses of ephedrin or adrenalin. Therefore, the degree of vasomotor and respiratory paralysis entailed by a loss of conductivity of all the roots below the level of the seventh thoracic segment should represent the maximum in an ideally controlled spinal anesthetic. Such a result is uniformly possible if certain refinements of technic are employed. If the operative field extends only to the level of the umbilicus, anesthesia is necessary only to the tenth thoracic segment. The margin of safety in such an analgesia is considerable. If anesthesia is needed just to the iliac crests, the anesthetic drug needs only to exert its action to the level of the first lumbar segment, and, as no vital areas are thus involved, the systemic reaction should be neglible. Likewise, localized perineal anesthesia can be obtained by preventing the anesthetic drug from ascending higher than the level of the fifth lumbar segment, thereby blocking only the sacral roots.

The control of the diffusion of the drug is of the greatest expediency. Bier, who was the earliest experimenter with spinal analgesia, recognized this fact and used cocain in several solutions of varying specific gravity, in order to limit its diffusion. Unfortunately, Bier, at first, had only cocain with which to work. This drug exerted such an undesirable toxic action on the nerve roots that it soon became recognized that new drugs must be found if spinal analgesia were to succeed. With Fourneau's discovery of stovaine, in 1904, added impetus was given to the use of spinal analgesia. Stovaine exerted a marked effect on both the anterior and posterior roots and gave many untoward

reactions. It soon lost its early favor. Babcock was almost alone in not discarding it, in spite of his early bad results. However, his advice to resuscitate the patient, by forced insufflation through an open tracheotomy wound and by cardiac massage to the arrested heart by "the simple and quick method" of introducing an index finger through a stab wound in the third left intercostal space, did not impress the average surgeon that the procedure was without danger.

Tropococain is only slightly less toxic than cocain, and has never had a wide use. Aposthesine is not as toxic as tropococain, but is more than twice as toxic as novocain. Six thousand spinal anesthetics induced with apothesine have been reported from Deaver's Clinic. Headache was common and nausea and vomiting occurred in nearly every case. Novocain, introduced in 1903, has been submitted to very critical pharmacological study, and is now recognized as the safest and most satisfactory local anesthetic. Sise, of Lahey Clinic, in recognition of its efficacy, modified Hepburn's glucose solution for spinal anesthesia by substituting novocain for the stovain of the original solution. Likewise, Pitkin has recently developed a novocain solution containing sufficient alcohol to give it a specific gravity less than spinal fluid and containing amylophrolamin to make the solution viscid. By the use of the Trendelenburg position the light specific gravity can be put to advantage. This same light specific gravity demands that injection never be made with the patient in a sitting position, and makes it imperative always to induce anesthesia with the patient lying on the side. Pitkin has shown the solution to be non-irritant to the arachnoid and pia-mater, and claims that the viscosity decreases the toxicity of the novocain, by lessening the rate of absorption, and in addition renders the anesthetic controllable. As has been mentioned, the ideal spinal anesthetic would be one induced with a relatively non-toxic drug, the diffusion of which could be definitely controlled. The experience of many who have used this novocain solution in a large number of cases seems to bear out Pitkin's original experimental and clinical observations.

Although the author has had occasion previously to use apothesine and crystalline novocain in a considerable number of cases, the last 305 spinal analgesias have been induced according to Pitkin's method. It has proven very satisfactory and seems to offer definite advantages over analgesia with uncombined novocain and other anesthetic drugs. In these 305 consecutive cases, operations of many kinds have been performed below the costal margin. There have been no deaths, and in no case did such an untoward reaction occur as to cause any anxiety or alarm. In no case has there been an absolute failure. However, in one case, even after a second injection, anesthesia was so long delayed that the operation was started with local skin infiltration. Yet, as the operation proceeded, anesthesia became established, and a laparotomy was satisfactorily performed. In seven other cases a second spinal injection was made necessary by lack of anesthesia to a sufficiently high level. These were all upper abdominal operations. It seems safe, in such cases, to increase the amount of anesthetic drug; since the author has done this, results have been uniformly good. The average length of anesthesia has been two hours. In several instances, however, satisfactory abdominal anesthesia has been maintained for two and one-half hours, and in many cases anesthesia was observed in the lower extremities and perineum as late as three hours after injection. Our attention is, of course, more sharply drawn to those cases in which the duration of anesthesia has not been sufficient to complete the operation. In only five cases has a short duration of the spinal analgesia been the reason for resorting to inhalation anesthesia. In three of these the duration of anesthesia was a

little less than two hours, and in two cases it was not quite one and one-half hours. With an operation lasting more than two hours inhalation anesthesia is anticipated, but is not always necessary. There has been no difficulty in localizing the anesthesia at any desired level. There has been no example of an alarming fall in blood pressure. The maximum decrease of the systolic pressure was 46 mm. of Hg., and this was observed during a cesarean section on an anemic patient with miliary tuberculosis. However, this marked reduction of blood pressure was probably not due entirely to the anesthetic, since it occurred fifty minutes after injection, during which time there had been considerable hemorrhage. In the usual analgesia extending only to the umbilicus there has been no remarkable variation in the blood pressure at any time. Most abdominal operations are performed without any evidence of vasomotor collapse, and, as has been stated, many hypotensive patients have been safely subjected to spinal analgesia. Five per cent of the patients exhibited nausea or vomiting, but even in these cases there were no symptoms suggestive of a high diffusion of the anesthetic solution. There has been no post-operative urinary retention which required repeated catheterization, and only in 20 cases was catheterization necessary during the first twenty-four hours. Most of these patients had been subjected to gynecological and perineal operations. In no case has headache occurred with sufficient severity to require active treatment. It has been the custom to elevate the foot of the bed to prevent headache. In cases of peritonitis the bed is either kept level or, later, may even be raised at the head with little fear of causing headache. As might be expected, the cases referred to one who is attempting to popularize a method of anesthesia are not always representative of the best surgical risks. This series includes many cases in which inhalation anesthesia was absolutely contraindicated and spinal analgesia used only because a bad risk was recognized. Misjudgment was shown when spinal analgesia was used in the case of a patient with senile dementia. In spite of the fact that analgesia was satisfactory, she became unmanageable during the operation, and inhalation anesthesia had to be employed. Lack of proper consideration of the patient's history was responsible for inducing spinal analgesia on a senile patient with arterial sclerosis, who had previously had three cerebral hemorrhages. In view of the fact that no untoward reaction or change in blood pressure was entailed by the anesthesia, it seems difficult to believe that a cerebral hemorrhage 24 hours after operation was entirely caused by the spinal analgesia. Nevertheless, it was an error of judgment to subject such a patient to spinal analgesia.

Certainly there is no one ideal routine anesthetic method in general use at the present time. Spinal analgesia properly administered, properly supervised, and properly controlled, meets a definite need in an increasing number of cases. There must be a careful selection of patients, yet as one acquires more proficiency in this technical procedure, the scope of its application can safely be extended. The extensive experience of many men indicates that novocain is the safest drug to employ for spinal analgesia. The special solution of novocain recommended by Pitkin is apparently definitely controllable, and, therefore, at present seems to offer the best method of inducing spinal analgesia.

DISCUSSION.

Dr. Urban Maes (New Orleans): It is a privilege to open the discussion of such a paper as Dr. Garside has presented. It is technical, scientific and thorough, and there is little for the clinical surgeon to add except in commendation.

My experience with spinal analgesia dates back many years. Dr. Rudolph Matas, whose assistant I was, was the first to demonstrate and publish the method in America, and Dr. Samuel Logan and I were responsible for the second publication on the subject, a series of twelve cases collected

from Dr. Matas' clinic. In those days we paid scant regard to the indications for this type of analgesia, we were using cocain and using it without control, and the results were so uncertain and the disasters so frequent that finally we definitely limited its use.

A little later the subject was gone into by Jonnesco, who in a tour of the country demonstrated stovain for this purpose, with some strychnin added to the solution, the latter agent being intended to overcome the bad results for which the stovain might be responsible. His percentage of deaths was very high—I do not recall the exact figures—and when it is remembered that the death rate in general or inhalation anesthesia was something like 1 to 1200 or 1400, it is not hard to understand why spinal analgesia readily fell into disrepute. For my own part, I was a pioneer in its use, but I was glad to abandon it, and it stayed abandoned, as far as I was concerned, until quite recently. Indeed, it is not more than eighteen months ago that I published a paper dealing with the management of acute abdominal emergencies, in which I both explicitly and implicitly advised against its use. I am sorry now that I made that particular statement, for, thanks to Dr. Garside, I have had a complete change of heart.

I am thoroughly convinced that spinal analgesia has made many unsafe surgical procedures both possible and safe. I have had a number of such cases in which I would either have refrained from surgery or done it in the full expectation of a fatal outcome. One of these patients was a woman weighing nearly three hundred pounds, who had had a profound jaundice for several months, and whom I considered a very poor risk. I drained her gall-bladder under spinal analgesia, administered by Dr. Garside, she made a brilliant recovery, and she has resumed her usual occupations. I do not think the operation should have been possible under any other type of anesthesia.

There are certain points, however, which must be emphasized if this method is to be employed properly. In the first place, it is not suitable for all cases, and unless careful selection is made, disasters are bound to follow.. The disrepute into which spinal analgesia fell in the past was entirely our own doing, and we must beware lest the revived method have a similar fate. Specifically, it is limited to surgery below the diaphragm; above that point, other types must be resorted to.

In the second place, this is a highly technical, highly specialized procedure, which calls for even greater skill in the administration than does inhalation anesthesia. It necessitates the constant services of a skilled anesthetist, who can recognize changes in the patient's condition and who can meet emergencies as they arise. It is not something to be administered and then disregarded. The anesthetist must be with his patient from start to finish, and he must give him his entire attention. The question of blood pressure is particularly important, for there may be a most alarming drop soon after administration. In this connection I might add that I recently had an experience rather at variance with Dr. Garside's account. A patient, practically exsanguinated from a hemorrhage from a duodenal ulcer, was transfused, and then, while still a very bad surgical risk, was operated upon under spinal analgesia administered by Dr. Baker. His blood pressure at one time was nothing over zero but he was bought back promptly with ephedrin and adrenalin, and he illustrates very well the importance of careful, constant watching. This operation, which I am sure would have been impossible under any other form of anesthesia, was concluded successfully, and the patient's convalescence was most gratifying.

Undoubtedly the control which is possible with the use of the solution devised by Pitkin is the desirable feature of the revived method. The solution can be regulated and its diffusion controlled, and the lack of that control was the thing that made all of the older methods inherently dangerous.

In conclusion, I might mention the ease of post-operative recovery which is usual with the new form of spinal analgesia. Under inhalation anesthesia the patient usually wakens within a short time after the operation is concluded, at a period when the pain is most intense and attacks of nausea and vomiting most frequent. With spinal analgesia the duration of insensitiveness is much longer, and in many cases I have been able to refrain from the use of post-operative sedatives and opiates because the acute pain had subsided before the analgesia wore off. In addition, the gaseous distention is as a rule markedly less than it is when inhalation anesthesia has been used.

Dr. Wilmer Baker (New Orleans): I feel honored to be called upon to discuss Dr. Garside's paper, but must say in the beginning that my experience with this type of anesthetic is rather limited. I have watched Dr. Garside give quite a number and have given a few myself, all told, several dozen at the outside. However, I must acknowledge that to watch a patient entirely conscious, at peace with the world, breathing easily without the puffing and blowing that some surgeons complain of is impressive, even to the general anesthetist.

My experience with blood pressure has not been quite as satisfactory as Dr. Garside's and the only explanation I can see is that perhaps lack of familiarity in administering the drug may have

something to do with it. In one case I failed to get anesthesia and cannot conceive of such an amount of solution being injected into the spinal canal without producing anesthesia; I certainly must have injected it outside of the canal, although I was able to withdraw spinal fluid.

In one or two instances the blood pressure has certainly fallen lower than I liked to have it fall. One of these cases has been mentioned by Dr. Maes, in which it was low to start out. In one patient it dropped to 40 or 50 systolic, the diastolic indistinguishable, which I attributed to the imperfect line of demarcation, for some reason the drug diffusing higher than I intended it to, due possibly to the fact that I had mixed it a little too freely or injected it a little too rapidly. That patient even complained of fingers being slightly numb—not anesthetic, but numb. This fall in blood pressure takes place fairly frequently and the average surgeon's chief method of combating it is adrenalin. Dr. Garside gives us ephedrin and adrenalin. Of course, using the light spinocain of Pitkin we already have learned that the first thing to be done is to lower the patient's head. Pitkin is the only one who has written much about the use of ephedrin; all the others have stuck to adrenalin, some giving it intravenously and some by the subcutaneous or muscular route. I have always been taught that adrenalin was dangerous, given either subcutaneously or intravenously. My experience with adrenalin in general has been disastrous and I never employ it. I have seen the blood pressure, under general anesthesia, 40 or 50, and after the intravenous administration of adrenalin rise to 240 and in five minutes be back to 40, consequently I think it can only do harm given in that way. The least dangerous and most efficacious way to combat fall in blood pressure is infusion. If adrenalin is given at all, give it mixed with the infusion, one minim per 100 c.c. of the infusion solution; administered that way it is not dangerous and will produce a rise in blood pressure, but not an excessive rise, which is prolonged to where it will do some good.

A possible disadvantage mentioned in regard to the use of the special light solution of Pitkin is that the patient's head must be lowered. To offset that Pitkin is experimenting with a heavy solution, in which event the position must be reversed and the patient's head raised and his feet lowered. I feel that a word of warning is necessary. Pitkin is not the only one using these solutions and when they go into general use, sooner or later we are going to have, through some error in position, fatal results. Therefore, those of us who use it should watch one point—do not let it happen here.

Dr. Garside failed to mention that Pitkin's solution has been used rather extensively in obstetrical cases. That is one place where I beleive it can be used successfully and give us something we cannot get with a general anesthetic. The only drawback is the limitation of time. If you can produce anesthesia of perineum and cervix—not anywhere else—with a preparation that will not limit the pains or reduce the intensity of the uterine contractions, a woman can come in and have a baby and not know anything about it. The only drawback, as already stated, is that labor might last a little too long, in which event we would have to resort to some other method, or repeat the injection of spinocain.

Dr. F. F. Loria (New Orleans): I am thankful for having heard Dr. Garside's paper and feel that I have learned considerably from it. My experience with spinocain is very limited, having used it in only about ten cases since Dr. Garside taught us how to use it. In seven of these cases anesthesia was practically perfect; in the other three I presume that failure to procure the required anesthesia might probably be traced back to myself, at least two of them. Not having used spinal anesthesia in as many cases as Dr. Garside, and many others who employ it almost exclusively, I rather blame myself, as very probably I did not use the proper technic. However, I wish to say something of these three cases. One of them has already been mentioned by Dr. Garside. It was a case of mitral stenosis in whom we had to inject the anesthetic twice. This was simply a case of delayed anesthesia. However, once obtained it was certainly perfect.

The second case was that of a woman weighing 230 pounds in whom there seemed to be a diffusion of the spinocain solution. To some extent I attribute this to imperfect technic; however, in looking back on this I believe it probable that the oldness of the spinocain at that time may have had something to do with it. In this instance we had anesthesia up to the clavicle and the patient even felt it (as Dr. Baker explained in his case) in the finger tips. It caused me much worry, but she finally recovered uneventfully.

The third case was an old woman of sixty-eight years with prolapse of the uterus and very large cystocele. In this instance the solution was injected at twenty minutes to eight and the anesthesia was perfect; but unfortunately some unforseen circumstances delayed the operation, and it was not possible to begin until seventeen minutes after eight. At fifteen minutes to nine the anesthesia had worn off. At this time we were ready to close the abdominal cavity and had to resort to inhalation anesthesia.

Dr. W. H. Kostmayer (New Orleans): I rise to add my little word of commendation to those

that have gone before. This is a very beautiful essay that Dr. Garside has given us, with most conservative conclusions.

My first experience with spinal was as an intern, later on, as a young surgeon. After carefully observing the after effects of cocain introduced into the spinal canal, temperature elevations 103° to 105°, paralysis of the limbs lasting sometimes three to four weeks, headaches, etc., then spinal did not appeal to me at all, and along with many others I stopped using it. Then came a wave of enthusiasm and we again started using spinal, principally with apothesin, but I had such untoward results in several cases that I began to feel like to Dr. Matas that anything which had to be used with an antidote ever ready was something he would resent having injected into his spinal canal. Just prior to Pitkin's work there came another wave in spinal. Going into the operating rooms and watching abdominal work it once more appealed to me. The absolutely relaxation, lack of necessity for packing off intestines, lack of vomiting, absence of saliva pouring out of patient's mouth, all became very tempting and I returned to the use of spinal in selected cases, particularly in cases with high systolic blood pressure so often associated with fibroids. The result has been so satisfactory that I am beginning to think I would not want to shoot the fellow who injected it into my spinal canal, but under certain circumstances would choose it to be used for myself.

I have had no experience with spinocain, Pitkin's solution. We are still using Metz' novocain, dissolving it in the spinal fluid and reinjecting it into the spinal canal. The technic is very important and I do not think a surgeon should tell his intern to go and give the spinal while he is scrubbing his hands, for the patient should be most carefully supervised.

I am now conducting a survey of the work done in the service during the past fifteen months covering some four or five hundred operations. Comparing the after effects of the inhalation type of anesthesia and spinal anesthesia, I find that when the latter is employed there is less retention of urine, less pain, less nausea and vomiting, practically absence of distension and the patient takes nourishment much sooner. So all in all it looks like an anesthetic almost ideal in certain cases, and in such cases I think all would do well to consider it.

Dr. E. Denegre Martin (New Orleans): I cannot add a great deal in the way of discussion, but I do want to endorse the use of spinal anesthesia in selected cases. My first experience with this anesthesia dates back to 1902 and I can clearly recall the first case I injected, which proved nearly disastrous. I spent the night and part of the next day with her; she recovered. I at once made up my mind to experiment (all others were doing it) and the first experimental subject was a dog. He was so completely anesthetized that you could stick a pin in any part of his anatomy, nose or tail—he could not feel the touch of his feet to the ground; after a while he began to become more sensitive and escaped through the window. From this I learned that gravity had a great deal to do with the anesthetic, and was one of the first to recommend elevating the head of the patient. I also advocated smaller doses, and realized that by injecting it slower would produce a better effect. My experience at that time was limited to 62 cases in the study of which I noticed that usually the same thing would occur, viz: headaches were less frequent, there was little nausea or vomiting, and recovery seemed to be more rapid when the head was elevated. This was not the rule, however, and I practically gave it up until recently.

I believe that with the introduction of spinocain, and the work done by Dr. Pitkin, we have something that is safe, and the fact that it can be controlled is more in favor of the drug than anything else. I want to emphasize, however, that it should not be used without experience. Just the other day I had a patient with asthma, but had no one to administer the anesthetic. I used Metz' anesthesia and he recovered very nicely, but when I have an operation of any gravity, I certainly want a trained assistant for the induction of spinal anesthesia.

Dr. Monroe Wolf (New Orleans): I was sorry to hear Dr. Garside mention that spinal anesthesia should not be employed in septicemia and would like to cite a case of ileus which was benefited by its use.

The case was one of septicemia due to pyelitis of pregnancy, in which catheters had been passed; about forty-eight hours after the insertion the patient's temperature began to rise and distension was progressive. Rectal stupes, the application of heat, and pituitrin given in small doses were without result, yet we did not feel justified in doing an ileostomy. On the fourth day a grain of tutoycain was administered between the eleventh and twelfth dorsal vertebrae and was immediately followed by the expulsion of a large stool and quantities of gas. I feel that this procedure saved that patient's life. The following day Dr. Havard induced labor and she made an uneventful recovery.

I do not know of any case where spinal has been employed as a therapeutic measure, but I

certainly advocate its use before resorting to operation in similar cases.

Dr. A. Mattes (New Orleans): It has been a pleasure to hear the essay presented by Dr. Garside and the generous discussion it has evoked. From what has been said it is apparent to all of us that with the use of controlled spinal we are confronted with the injection in the spinal canal canal of a solution, in case someone does something by error, that will probably kill your patient. Again, the use of such a solution entails with it the presence of a highly trained individual, something that we have not had with us since the introduction of any of the anesthetic agents previously employed in spinal anesthesia. Using it in work as high as the kidney we have seen no reason to employ a special anesthetist—just by carefully watching the patient ourselves, with the assistance of a trained nurse, we have used it satisfactorily. Now, if you are going to undertake to have in the operating room trained anesthetists only for the induction of spinal anesthesia, you are going to do that which immediately takes spinal anesthesia away from every small group or small clinic and puts it with only the large groups and large clinics. Since the introduction of spinal by Dr. Matas we have popularized it in the genito-urinary services, and although we greatly favor the use of spinocain, it has its drawbacks. Should anyone fail to keep the patient in the proper position for a certain length of time, or should the table suddenly tip, death might ensue. I feel that if one has never used the solution it has certain drawbacks and that the patient is much safer in the use of a solution where the sudden tip of the table or loss of control of the patient will not prove so disastrous. Of course, it is possible for any of these things to happen with any spinal but attended with a lesser degree of risk.

With regard to the use of spinal analgesia in the acute abdomen. In the case of a partially walled off appendiceal abscess should you produce complete relaxation you are apt to have a localized peritonitis become a general affair. In the hospital we have found that these acute abdomens do not do as well under spinal as they do under general; that a complete relaxation of three to four hours is disastrous. Therefore, I am sorry that Dr. Maes centioned that he is entirely converted to its use in the acute abdomen. What we have learned in our private work and our work at Charity Hospital is the fact that it is not an ideal agent to employ, but that it is far better to use ether or local.

Dr. H. R. Unsworth (New Orleans): While I have enjoyed the doctor's paper, it strikes me that he is over enthusiastic. Our interest lies in the aftermath of spinal anesthesia many months following its use. We must not loose sight of the fact that myelitis follows trauma and that spinal puncture is always associated with a certain amount of trauma. It merely takes a microscopic lesion to produce a myelitis. It appears to me that spinal anesthesia is being used almost routinely, without discretion as to its specific indication. I believe it is called for in certain cases, but think there is a definite possibility of myelitis following a misjudged anesthesia.

Dr. Earl Garside (closing): I appreciate very much this generous discussion. Unfortunately, time did not permit an explanation of technic, and since details could not be emphasized they have been omitted from this short paper.

Dr. Maes called particular attention to a type of case that has already been especially mentioned; that is, the patient in a state of shock from hemorrhage. These collapsed patients are not good risks for spinal analgesia. In the case of the patient cited by Dr. Maes, he was confronted with a condition necessitating immediate operation, and with Dr. Baker administering the spinal analgesia the operation was performed with the patient in a satisfactory condition, except for a rather marked decrease in blood pressure. Dr. Baker mentioned the respective value of adrenalin and ephedrin. The difference between the two drugs, adrenalin with its rapid action and short duration, and ephedrin with its slower action and more prolonged duration, determines the indications for their employment. Ephedrin must be given before induction of the analgesia and its action will easily outlast the effect of the analgesic. As a rule, 50 milligrams of ephedrin sulphate is given if analgesia is to be procured to the level of the xiphoid, and 25 milligrams is sufficient with analgesia to the level of the umbilicus. There is rarely any need to use any ephedrin in cases with analgesia below the umbilicus. It seems only fair to say that a definite degree of localization of analgesia can be obtained by using only crystalline novocain. However, the controllability is only a relative matter, and cannot be obtained in all cases. Also, to limit the extent of analgesia the dose of novocain must be materially decreased, which will also shorten the duration of analgesia.

CONGENITAL INTESTINAL OBSTRUCTION: REPORT OF CASES.

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Congenital intestinal obstruction may be defined as a condition arising from maldevelopment of the intestinal tract in utero, the result being varying degrees of narrowing of the lumen or absence of entire portions of the intestine.

INCIDENCE.

The first case of congenital intestinal obstruction was reported in 1797 by Oslander. An idea of the rarity of this condition may be realized from the fact that Spriggs, in 1912, could collect only 328 cases in the literature covering a period of fifteen years. In 1918 St. George found but two cases in the pathological records in Belleview Hospital over a period of fourteen years. De Sanctis and Craig, in 1929, found but 129 cases of duodenal atresia in the literature. Theremin found the indidence to be 11 cases in 260,000. Battley[1] found the condition to occur in every 20,000 infants. This is the rarest form of intestinal obstruction.

ETIOLOGY.

Although many hypothesis relative to the causation of atresia have been advanced, none of the theories are capable of accounting for all cases. The most important theories are ennumerated:

[1]Bland Sutton (1889), advanced the theory that the condition is due to errors in development at the important sites of embryological events. For example, the junction of the vitelline duct of the embryo and the ileum. Normally, the vitelline duct is obliterated at an early stage of fetal development. If this obliteration fails to occur, or does so only to an incomplete degree, a diverticulum is formed. On the other hand, if the obliterative process is excessive, it may involve the ileum as well as the duct, producing an atresia or a stenosis at this point.

[2]Tandler's theory (1902), is based on the fact that the intestinal tract in the embryo is a tubular cavity, and the epithelial proliferation and hyperplasia of the cells about the cavity causes closure of the lumen of the gut. At the third month of fetal life, this is recanalized with the resultant patency of the gut. A failure to recanalize results in atresia or stenosis of that portion of the tract.

[3]Emanuel's theory (1903), concludes that some intestinal stenoses are due to strangulation of the gut as a result of twisting or rotation of the gut, fetal volvulus, etc., that occurred in the process of coil formation and lengthening of the intestines.

Jaboulay (1902) believed the condition to be due to some associated anomaly of the blood supply which interfered with the normal development of the gut in the area supplied by this vessel or vessels.

Among the minor causative factors may be included fetal peritonitis, traction due to herniae, pressure by new growths, mesenteric embolism, intussusception and twisting of the mesentery. However numerous the theories advanced, none can fully explain every case.

PATHOLOGY.

Obstruction may occur at any point in the intestinal tract. They are more frequent in the small intestine than in the large, and are more often in the duodenum than in the ileum or jejunum. However, this point is by no means an established fact. Landau placed the jejuno-ileal junction first in frequency, the duodenum next and the large bowel lastly (excluding rectal atresias). In 15 per cent of cases the lesion is multiple, the ratio of single lesions to multiple ones being 5 to 1 in Lippitt's and Morter's series. [2]Atresia is more commonly noted than stenosis. The degree

of involvement varies from a slight narrowing of the intestine to extreme degrees of stenosis and atresia. The atresia may vary from involvement of a short segment of intestine to absence of an entire portion, this part being replaced by a fibrous cord. The intestine above the obstruction is dilated and the muscularis hypertrophied; below the obstruction the bowel is collasped and atrophied, which however is quite patent and able to be distended to normal size. A feature of the condition is the tendency of the bowel distal to the obstruction to be in a state of marked spasticity. Thus a functional atresia is superimposed upon an organic one. This is an important factor in dealing with the condition from a surgical standpoint, for it is to this condition we can ascribe the nearly hopeless prognosis. When the obstruction is in the duodenum, it is usually proximal to the ampulla of Vater, but it may be in the region of the opening of the duct and be associated with anomalies of the pancreatic and biliary passages. Complete stenosis is found to be more common than is a partial one. According to Spriggs, we usually find one of the following pathological conditions present:

(1) Simple narrowing, (2) perforated diaphragm, (3) complete diaphragm, (4) short bands connecting free ends of bowels, (5) thread like bands along the free edge of the mesentery, the ends of the bowel being some distance apart, (6) a gap in the mesentery, there being no direct connection between the ends of the bowel.

SYMPTOMATOLOGY.

Vomiting is the most constant symptom; it usually begins shortly after birth and is persistent. This vomitus may contain bile if the obstruction is distal to the ampulla of Vater. If bile stained, it is said to be a point of differentiation between obstruction and pyloric stenosis; no blood is usually present in the vomitus. The frequency and the amount of vomitus depends on the shortness of the gastro-intestinal tract above the obstruction. Meconium may appear in the vomited material. Gastric retention may be demonstrated by the vomitus containing food or drugs taken hours or days before.

CONSTIPATION.

As a rule there is a history of no bowel movement since birth, cathartics and enemata are without effect. There may be a small meconium stool passed spontaneously or with the use of enemata, but nothing further is obtained. Stools may be passed in cases where the lower bowel is large enough for it to contain meconium and mucus to evacuate.

DISTENTION OF ABDOMEN.

This varies with the location of the obstruction. In duodenal obstruction the stomach stands out prominently, filling the entire upper abdomen, while the lower abdomen is relatively small. When the obstruction is low, the abdomen is more uniformly distended. Visible peristalsis may be pronounced, but is usually not as marked as that seen in plyoric stenosis. Distention is most marked when the obstruction is low down in the intestinal tract. A tumor may or may not be felt. Anuria is usually marked due to slight absorption of fluids. Jaundice is present at birth in few cases, and it may be very marked and persistent, especially when there is an accompanying malformation of the biliary apparatus. The combination of icterus with vomiting is suggestive but on the other hand there is nothing about the jaundice to differentiate it from the fleeting icterus neonatorum. Emaciation is rapid and progressive and becomes critical in the second and third twenty-four hour period of the child's life.

PROGNOSIS

Holt (3) states, "In the newly born, persistent vomiting is invariably dependent upon congenital intestinal obstruction which is most frequent in the duodenum." Again Lippitt and Morter state, "Given a newly-born infant with a patent anal opening who has passed no meconium; who swallows normally, but who vomits per-

sistently and who has abdominal distension, the only diagnosis possible is intestinal obstruction."

Richter (4) makes the notation of "Given the above symptom complex which develops in the first few hours after birth and the course rapid and progressive, congenital intestinal obstruction is almost the only condition to be considered."

DIFFERENTIAL DIAGNOSIS

(1) Hypertrophic pyloric stenosis (functional and organic), may be excluded as to the time of origin, both conditions usually developing after a preliminary normal period of days or weeks. The onset of congenital obstruction invariably dates from birth. Even when pyloric stenosis is accompanied by vomiting from the first few days of life, the phenomena of intestinal obstruction does not develop after a number of days. If the vomitus contains bile, the evidence is against pyloric stenosis.

(2) Imperforate anus may be excluded by digital examination.

(3) Esophageal atresia.

This condition is accompanied by regurgitation of the very first mouthful of food and water taken and when a communication with the trachea exists, as it does in the majority of cases; it is accompanied by characteristic attacks of cyanosis. Food is rejected without having reached the stomach and is unchanged, whereas in intestinal obstruction food is accepted before vomiting occurs. Passage of a catheter will immediately determine whether an esophageal stricture is present or not.

(4) Cerebral birth injury.

May be excluded by absence of marked emaciation and rapid progress characteristic of intestinal atresia. In birth injuries passage of food stools occurs also. Spinal puncture may aid in the diagnosis.

DIAGNOSIS

The outlook for the baby is extremely grave, for the diagnosis is rarely made early and the child is usually in extremis before it reaches expert hands. When one considers that in this obstruction the intestine distal to the obstruction is collapsed, small, wormlike, and tightly contracted, any surgical procedure would be at its very best quite difficult. However, with an early diagnosis, proper surgical procedure, the outcome in a considerable number of cases should be quite fair. Single lesions offer the best prognosis. Multiple lesions are practically hopeless.

Richter (3) states, "Aside from the atresia of the anus up to 1924 there have been three operative recoveries reported in the literature. Two years later, Grulee added one more operative recovery to this series." This will serve to show that the condition is practically hopeless. The failure to obtain more favorable results has probably resulted from the attitude of the profession as to its hopeless prognosis, rather than from the hopelessness of the lesion.

TREATMENT

The treatment of this condition is necessarily entirely surgical. In 1889, Brand Sutton made the first attempt to relieve the condition by surgical procedures, the operation consisting of an enterostomy.

Fockens performed the first successful operation by anastomosing the bowel segments. Enterostomy is the surgical procedure of choice in most instances. The difficulty that presents itself is the contracted state of the lower segment and as this can be dilated to normal size by air or water pressure, the proper procedure then consists of doing an immediate anastomosis.

(5) McLennon states, "That gastroenterostomy and duodeno-jejunostomy have a very high mortality in infants, even if in good condition, but in a moribund infant there is little hope for success. The operation is practically doomed if it consumes

more than twenty minutes." In high atresia of the rectum in which it is impossible to approximate the segments, the creation of a low artificial anus may be necessary. When the obstruction is in the duodenum or duodeno-jejunal junction, gastro-jejunostomy is usually done.

REPORT OF CASES

Case No. I—

Female child of L. B., aged 3 days, entered the hospital August 1, 1919, because of persistent vomiting which had begun one hour after birth. No meconium had been passed either spontaneously or by the use of purgatives or enemata. The patient died shortly after admission. No necropsy was permitted, but clinically, the case was one of congenital intestinal obstruction.

Case No. II—

Female child of E. K., aged 5 days, entered the hospital on December 28, 1922, because of persistent vomiting, which began shortly after birth. No bowel movement had occurred since birth. The upper abdomen was markedly distended, the patient showed signs of extreme dehydration. Roentgen-ray examination demonstrated a complete obstruction beyond the pyloric end of the stomach. A laparotomy was performed immediately on admission, under ether anaesthesia. The stomach, first and second portions of duodenum were found to be greatly distended; the small intestine was collapsed. The exact nature of the obstruction could not be determined, but it was thought to extend beyond the second part of the duodenum, under the pancreas and adjacent structures. A posterior gastro-enterostomy was performed in twenty-two minutes; the patient died two hours later.

A necropsy performed showed the gastro-jejunostomy to be patent. The duodenum was markedly dilated, and was imperforate at the duodeno-jejunal junction, because of an atresia at this point.

Case No. III—

S. S., male child, aged 2 days, admitted on July 9, 1923, because of obstinate constipation and persistent vomiting since birth. Laparotomy performed under local anaesthesia showed an atresia of the terminal ileum. A lateral anastomosis between the ileum and the caecum was performed, patient dying one hour later. No necropsy was permitted.

No. IV—

E. T., female, aged 3 days, was admitted on January 31, 1924, because of vomiting of a brownish material. No bowel movements had occurred since birth. The patient was markedly dehydrated and the abdomen considerably distended in the epigastrium an left upper quadrant. Definite coils of intestine could be mapped on the anterior abdominal wall, and active peristalsis was elicited. Laparotomy performed immediately on admission showed an atresia of the jejunum about six inches from the ligament of Trietz. The proximal ileum presented seven distinct separate constructions. The distal half of the ileum and colon was patulous. The constricted portion of ileum was resected and an end to side anastomosis between the ileum and jejunum was performed. The child died four hours later. No necropsy was permitted.

No. V—

Female child of E. L., premature, thirty minutes old, weight three pounds, was admitted on September 18, 1927, and died fourteen hours later. Necropsy performed showed an atresis of the distal portion of the ileum near the ioeocaecal junction, the ileum terminated in a blind pouch. The caecum and appendix were absent, an atresia of the proximal portion of the ascending colon was present.

No. VI—

A. L. S. Female child, aged 3 days, admitted on March 28, 1929, because of vomiting which began immediately after birth. The first vomitus consisted of a large quantity of amniotic fluid aspirated while in utero. The child had vomited everything taken by mouth. The vomitus was bile stained, and no evidence of meconium was present. There was no associated sensation of nausea for immediately after the vomiting reflex, the child nursed vigorously. The length of time elapsing between food intake and vomiting varied from a few minutes to a half-hour after nursings. The vomitus was practically the same amount as the fluid ingested. Emesis was not projectile in type, but was more in the nature of a regurgitation. The birth weight was 11 lbs., on admission the weight was nine pounds two ounces. Normal meconium stools were passed three times daily since birth. The infant made no attempt to nurse the breast. Jaundice had grown more intense each day. Nothing had been present which would suggest a hemorrhagic diathesis. She had grown progressively weaker and more irritable daily.

Physical examination showed a markedly dehydrated and deeply jaundiced infant; marked loss of weight being evident. Kussmaul type of breath-

ing was present and acetone could be detected on the breath. The fontanels were depressed and the suture lines overlapping. The abdomen was distended especially in the left upper and both lower quadrants. Visible gastric peristalsis could be elicited. No tumor masses were palpable. After the ingestion of four ounces of water, the curvatures of the stomach could be definitely outlined, and were found to be the cause of the abdominal distension. Liver and spleen were not palpable. The rectum was patent.

PROGRESS:

4/29/29—

Flouroscopic examination showed the stomach to be enormously dilated, filling the entire abdomen. The pyloric antrum and duodenal cap were greatly distended. The pyloric ring was definitely patulous. A barium enema was not retained due to marked colonic spasm. Six-hour plates of the stomach and bulb showed barium still present in the stomach. No trace of the meal could be seen in the intestine. Three meconium stools were passed and found negative for occult blood. A small amount of carmine was given to determine if the intestine was patent. Enemas given eight, twelve and twenty-four hours later showed no trace of the dye. A gastric retention of four and a half ounces was found by aspiration. The stomach capacity was found to be eight ounces.

4/30/29—

Jaundice was more intense than on the previous day. An area of extensive subcutaneous ecchymosis was noted at the site of a hypodermoclysis given the day before. Flouroscopic examination showed the pyloric antrum and the duodenal cap to be filled with barium. No trace of the meal was noted in the intestine. Shortly after return to the ward, the patient had a hemorrhage, evidently gastric in origin. About 150 c. c. of blood tinged fluid being vomited; the child expiring immediately.

NECROPSY REPORT:

The stomach, pylorus, and first and second portions of the duodenum were enormously dilated; practically filling the entire abdomen, and contained a dark red granular fluid, which resembled old blood. The pyloric ring was patent; at the junction of the second and third portions the duodenum tapered to a thin fibrous band, just proximal to which the pancreatic duct emptied into the duodenum. This atresia measured 2 c. m. in length, distal to which the tightly contracted small intestine continued its course. The large intestine was contracted and presented no gross changes. The omentum was rudimentary. No microscopical changes were present in any of the internal organs.

SUMMARY

(1) Congenital intestinal obstruction is defined.

(2) The incidence of congenital intestinal obstruction has been found to occur about once in every 25,000 infants. In the records of Charity Hospital, excluding imperforate anus, we can find records of only six cases of congenital intestinal obstruction, including our own.

(3) The various theories of etiology are discussed.

(4) In our cases the obstruction occurred at the following points:

(1) Duodeno-jejunal junction.

(2) Terminal ileum (two cases).

(3) Second and third portions of the duodenum.

(4) Multiple atresias of ileum and jejunum.

(5) Terminal ileum and ascending colon. No necropsy was permitted in two cases.

(5) In a newly born infant presenting the following symptoms, persistent vomiting, constipation, abdominal distention, emaciation, jaundice and anuria, the diagnosis of congenital intestinal obstruction should be made.

(6) The prognosis is extremely grave, early diagnosis and surgical intervention offers the only hope for recovery. We can find records of only four operative recoveries in the literature. Three of our cases were operated upon and proved fatal.

(7) The treatment of this condition is entirely surgical.

Imperforate anus is not considered in this discussion.

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EXTERNAL OTITIS, ITS CAUSE AND PREVENTION*.

GEO. E. ADKINS, M. D.,

JACKSON, MISS.

External otitis is defined as an inflammation of the external ear, and from my viewpoint occurs in two forms, which for want of a better classification I refer to as the moist and the dry.

The moist form is usually found uncomplicated but occasionally is complicated with an otitis media or even an acute mastoiditis and presents two classical symptoms from which the diagnosis is made. First, the history of pain and probably a slight clear discharge; second, on inspection we find the canal eroded, moist and containing particles of degenerated skin surface, swelling, with tenderness on manipulation of the soft part. The condition is probably best differentiated from an acute mastoiditis by the history and mode of onset and by the manipulation of the soft part against deep pressure over the mastoid antrum without moving the auricular canal.

*Read at the Sixty-second Annual Session of the Mississippi State Medical Association, May 14, 1929.

The moist form of external otitis occurs at all ages and all seasons but is found much more prevalent in the summer months and among those of playing or swimming pool age, and apparently is due to the retention of moisture in the external canal. This moisture remains in the canal at body temperature until a fungus growth has sprung up, the common old mildew that we find on towels or other fabrics that has been packed away wet. This fungus formation and the retained moisture causes a desquamation of the external skin surface followed by fissure formation and later some form of infection which passes on to the subdermal structure and completes the picture of moist external otitis.

The dry form as I have called it for want of better classification occurs at all ages and all seasons but is far more frequent in the patient that has passed the play age and is probably slightly more prevalent during the cooler months, and again we have two classical symptoms from which the diagnosis may be made. First, the history of itching, and, second, on inspection, we see the desquamation and scaling of the skin surface lining the external canal. The dry form is frequently transformed into the moist, always I might say when the condition is progressive enough to produce fissure formation of the skin. This is then followed by the same fungus growth and infection that we find in the moist form.

Let me mention for practical purposes, not going into the anatomy, that the condition is found in a cartilaginous canal which is lined with skin, the skin being reflected over and forming the outer surface of the drum membrane and that this skin located as it is, is not subjected to the external forces that harden the outer layer such as sunlight, air and friction, the common forces that are exerted on the skin covering the body surface as a rule. This skin remains delicate throughout life but likely does become more resistant as the patient grows older and probably accounts to some

extent for the older person having the moist condition less frequently.

I am attempting to show that the local manifestations of external otitis, the moist form, and the dry form when it is transformed or passes into the moist form, is produced by one common cause, namely, retained moisture in the external canal. It is rather easy to understand how the child of play age gets the moisture into the canal and retains it long enough to undergo these succeeding changes, and that constant moisture in the external canal will result in an external otitis is rather generally accepted, but it is the class of patients past play age that has kept us in doubt. We are all familiar with the urticaria let it be dry or weeping as the dermatologist would classify it, or at least we recognize the reaction of a digestive disturbance on the skin, the itching and stinging that one experience after eating something to which we have an idiosyncrasy or the taking of some drug such as quinin that is so frequently followed by a rash on the skin. Remembering now that the skin located in the external auditory canal is a very delicate structure not hardened by the external forces previously mentioned, it is readily understood why this skin reacts more quickly and certainly more frequently than the skin covering the commoner or exposed surfaces of the body. When this reaction takes place it occurs in the external canal first. This phenomenon is followed by scaling, desquamation, itching and if the progress goes to to fissure formation, is followed by infection, and the entire course of external otitis is gone through.

It occurs to me that the only debatable question would be just what constitutes an inflammation. If an infection must first be present followed by scaling, fissure formation, pain and discharge, the answer must be a different one from what it will be if scaling, fissure formation, infection, pain and soreness is the course, but it is my opinion that the infection is a secondary proposition. However, it must be reckoned with when it occurs in the course of the disease where infection follows, but is undoubtedly not the exciting cause or primary stage of external otitis.

Let one immerse the hand in water for fifteen or thirty minutes or draw on a wet rubber glove for the period of an operation and afterwards observe the wrinkles and degenerated condition of the skin, remembering that if this occurs on the hand how much more readily it would occur in the external canal where the skin is much more delicate and the moisture retained for a longer period of time and at body temperature. After the skin is moistened long enough to cause degeneration it certainly must undergo scaling and desquamation. On the body surface this desquamation is lost, unnoticed, and the surfaced is dried by the air and sunlight, but not so in the external auditory canal for here the desquamation must drop down lodging in the canal along with retained moisture, the yeast fungi spring up, the fissure formation is produced, and the infection follows.

A few years ago pharmaceutical houses advocated the use of Bulgarian bacillus emulsion applied locally for the relief of external otitis and the remedy was not without value, but in those days was an empirical remedy whereas if my theory be correct, it can be classed as a rational one for it did inhibit the development and growth of the yeast fungi, and prevented many times the succeeding steps in the disease.

The prevention of external otitis would mean the keeping of moisture out of the external canal.

These cases come to the aurist because of the location of the malady and he rightfully attends to them for the same cause for the location of an inflammation in the external ear canal is certainly dealt with more perfectly by those who are skilled in the use of head mirror, speculum, and cotton applicator than one who does not so frequently use the instruments, but if it

was not for this, the moist form of external otitis would probably be found in the hands of the dermatologist and the dry form in the hands of the gastro-enterologist.

The case that comes as a result of some gastro-intestinal condition must be dealt with by physicians in other branches of medicine or by a periodical health examination and early diagnosis and treatment of the conditions. The case that comes as the results of the swimming pool might be combated by educating people that moisture in the ear from any cause is a detriment. The cases that we as otologists can combat or prevent are those coming as the result of frequent irrigations as prescribed by physicians, nurse, druggist or some good friend who has not differentiated the case. Personally I am of the opinion that irrigation in any ear condition is not good practice unless done by some one who can sponge the canals dry afterwards, and even in such hands should not be repeated often.

DISCUSSION.

Dr. E. F. Howard (Vicksburg): There is one little suggestion which comes to my mind that I have tried with very good results. We know that we begin to look for trouble in the swimming season. Every now and then somebody comes trailing in with an infection. The modern swimming pool is cleaned out every day. It can only be from the moisture that is retained. I have come to handling some of my patients in this way. You have to pick out an intelligent patient to trust. You have to show them how to dry their ear out, to dry it with a little mop or a little cotton on a match. Dry the ear thoroughly, and you can stand a whole lot more drying when you are doing it yourself than when somebody else is drying it. It is a rather sensitive proposition. The patient can take the little mop or match with the cotton in it and dry the ear well. Fill it with alcohol for a few seconds, which will be very effective. I have been able to add a good deal to their comfort in that way.

Dr. C. A. McWilliams (Gulfport): There are a lot of cases in which there is absence of wax in the ear. It causes a good deal of pain when the canal is filled with wax. If you have a case that has too much wax in the ear use a little oily base, such as glycerine or vaseline—anything that will form a protection for the canal in the ear, and which will prevent getting water in the ear when going swimming. We advise the patient to use either white vaseline or cold cream, or any kind of oil, to completely cover the ear so that the water will not get in when going in swimming. Practically all my cases occur in the spring and summer, when perspiration gets in the ear. The treatment is very difficult. I find that alcohol and boric acid gives much relief. I have not yet found a real cure for this.

CASE REPORTS AND CLINICAL SUGGESTIONS

A CASE OF CARDIOSPASM.*

O. W. BETHEA, M. D.,

NEW ORLEANS.

Briefly, this case is somewhat as follows:

Mr. Y. is a civil engineer, employed by the Andean National Corporation, and was working in Columbia, S. A. He is 31 years old, married and has one child. His family and marital histories are irrelevant. He has always been a strong, robust person; in fact, remembers no previous illness except a carbuncle five years ago. He led an active, outdoor life. His personal habits were excellent.

On May 7 while hunting in the vicinity of his station he was bitten by a snake. The wound was on the anterior aspect of the right leg, at the juncture of the middle and lower thirds. The snake was not seen. He immediately applied a tourniquet, made of a strip torn from his clothing, but it was not properly applied and probably had little value. Within about thirty minutes after being bitten he was in a hospital under medical care. The wound was treated locally, but it was two or three days before antivenene could be obtained and administered.

He developed a stormy course with pain and swelling of the leg, dyspnea, hematemesis, hematuria, intestinal hemorrhage, tachycardia, prostration, high temperature, chills and all the evidence of shock. For several days it was not expected that he could survive.

Following this stormy onset, he developed gangrene of the leg. Numerous incisions and excisions of tissue were made, and the leg was not amputated only because it was felt that he would not survive the operation.

*(Presented at Clinical Staff Meeting, Baptist Hospital of New Orleans, June 8, 1929.)

Roentgenograms Demonstrating Cardiospasm

Early in convalescence he began vomiting, and for days at a time was unable to retain any food by mouth, and it was realized that the food was not reaching his stomach.

He was sent to me at the Baptist Hospital in New Orleans in the hope that we would be able to better carry out any measure that might be indicated. He arrived in New Orleans July 3.

He was found to be extremely emaciated, having lost nearly fifty pounds in weight. Prostration was marked. Otherwise, our examination showed nothing of interest, except the following:

Blood pressure, 102/68. Pulse, 90. Respiration, 22. Temperature, 99.4° F. Abdomen retracted, and tender upon palpation in the epigastric region. The leg was still discharging in several places.

The urine was alkaline, and showed 2 plus indican. P. S. P. (intramuscular) was 25 per cent in two hours.

The blood showed red cells 3,150,000, hemaglobin 65 per cent, white cells 6,250, S. M. 20, L. M. 4, N. 75, E. 1. No plasmodia were found. Wassermann negative. Blood chemistry normal.

All efforts at passing the stomach tube were unavailing though various types were tried.

We made roentgenograms as shown herewith and were able to satisfy ourselves that his condition was one of cardiospasm.

For several days there were periods of enough relaxation to enable us to give him some liquid nourishment by mouth, but as his state of nutrition was gradually becoming more unsatisfactory, Dr. Allen, whom I had associated with me in the case, did a gastrostomy and we began feeding him through the tube placed directly into the stomach, and everything by mouth was withheld. His response was prompt. He gained about ten pounds in the course of a few weeks, and after gradually resuming activity, went to the country for a month's recuperation with his family. He then returned for further observation, and we found that he had gained about ten more pounds and was feeling well. We permitted him to take two weeks longer in the country, after which he again returned to the hospital and we now have begun dilating the esophagus. This seems to be proceeding satisfactorily, and we are in hopes of returning him to full activity within a few months.

TYPHUS FEVER IN LOUISIANA.

A CASE REPORT.

J. H. MUSSER, M. D.,†

NEW ORLEANS.

Dr. W. C. Rucker has recently reported the first case of typhus fever to arise in Louisiana. The following report represents, as far as I know, the second case of this disease. The Weil-Felix reaction in this case early showed doubtful reaction. There was complete agglutination up to 1-80 on May 23. On the thirtieth of the month there was complete agglutination up to 160, partial agglutination up to 320. Negative controls showed no agglutinations. The known positive control (the case of Dr. Rucker) showed complete agglutination 1-200 and higher. The saline control showed no agglutination. In addition to the serologic examinations, there was a quite characteristic conjunctivitis and a typical maculo-papular rash of the chest and abdomen. There findings, in addition to the short duration of the disease, 15 days, the negative laboratory findings, the history of typhoid fever a few years ago, and the very definite Weil-Felix reaction which occurred, as it should, late in the course of the disease, point definitely to the diagnosis of typhus fever.

CASE REPORT.

F. S., a laborer, aged 25 years, was admitted to Ward 214 at Charity Hospital on May 19.

Chief Complaint. "Fever, headache and cough."

Present Illness. About 12 days ago while gathering moss in the swamps, the patient contracted a cold which was accompanied by a slight cough and frontal headache. The cough was at first dry but later it became more severe and moist in character. The following day the patient went out to work again. He felt very badly and with the other symptoms had general body aches and a little fever. As soon as he returned home at night he went to bed. He did not call a doctor, but took a few doses of 999. He remained in bed until his departure for the hospital. During his stay in bed he suffered from the symptoms mentioned above. His bowels have been regular, moving about twice a day, being of normal color and consistency. There have been no urinary symptoms. His appetite is poor and he has been eating very little.

Past Medical History. The patient claims he had typhoid fever several years ago, when he remained in bed less than a month. He has had no other illnesses.

Social History. For the past three months the patient has worked in the woods gathering moss. He has had regular meals. He has not been exposed to any contagious disease. He drinks cistern water. No one in his neighborhood has been ill with fever.

Physical Examination. (Abstracted.) The examination of the patient reveals a well-developed and well-nourished white male lying quietly in bed, mentally alert, but feverish and apparently suffering some acute infection.

The skin over the thorax and abdomen contains numerous small macules, some of which are almost papular and of a rather pinkish red color.

Eyes. Conjunctiva, both palprebal and sclerae, are injected. Slight photophobia and blephrospasm noted. The right pupil is slightly larger than the left. The pupils react to light and accommodation.

Chest. Well developed. Expansion is good and symmetrical. The percussion note is slightly decreased at the right apex. Sibilant and sonorous rales are heard over both lungs. They are transient and heard more constantly over bases.

Heart. The sounds are slightly muffled. They are regular in rate, rhythm and volume.

Abdomen. Skin presents eruption as described above. There is no rigidity and no masses are felt.

Extremities. The patellar tendon reflex is slightly increased; otherwise they are negative.

Progress Notes. 5-19-29. Admitted to Ward 214, with provisional diagnosis of typhoid fever. History is fairly typical. Essential point in physical examination is conjunctivitis, evidence of bronchitis, maculo-papular eruption on skin of abdomen and chest, and a questionably palpable spleen. Pulse 98. Patient taken with acute abdominal pain this afternoon, which subsided after a short time. Highest temperature, 103.5°; pulse, 104; respiration, 18.

5-20-29. Temperature 102°; pulse, 84; respiration, 28.

5-21-29. Widal shows some slight agglutination with B. typhosus in dilution of 1-50, 1-100, 1-200

†From the Department of Medicine, Tulane University of Louisiana School of Medicine and Charity Hospital, New Orleans.

after 1 hour. Temperature down this morning; pulse rate normal. Patient comfortable. The eruption has faded somewhat today. Wassermann negative.

5-22-29. Highest temperature, 99°; pulse, 72; respiration, 20.

5-27-29. Doing well; convalescence uninterrupted.

6-7-29. Patient has been practically fever free since 5-22-29. Discharged.

LABORATORY REPORTS.

Urine entirely negative.

Blood counts—	5-20-20	5-23-29
Total red cells		4,350,000
Total white cells	11,250	10,000
Hemoglobin		80 per cent
Small mononuclears	11	14
Large mononuclears	9	9
Eosinophiles	0	0
Polymorphonuclear neutrophiles	80	77
Pathogenic cells	None	None

Serology. 5-21-29. Widal negative.
5-21-29. Blood Wassermann negative.
5-21-29. Blood Widal: moderate agglutinations with B. typhosus in dilutions of 1-50, 1-100, 1-200 after 1 hour.
5-23-29. Weil-Felix: complete agglutination 1-80.
5-23-29. Blood culture: ox bile to agar transplant shows no growth after 24, 48 and 72 hours.
5-30-29. Weil-Felix reaction positive as noted in the first portion of this report.

Summary. A second case of typhus fever, occurring shortly after the first one reported, indicates that the disease is endemic in Louisiana. It has been shown to be present in several other Southern States by the U. S. Public Health Service.

CARELESS USE OF THE ENGLISH LANGUAGE.—The first and foremost atrocity is the misuse of the word "operate." Such expressions as "I operated him," "The case was operated," and similar abominations, appear frequently in our standard medical journals, are used in conversation and, worst of all, are taught to the student in some of our best medical colleges.

The word "operate" is derived from the Latin noun "opus" and verb "operari," eamning "work," and we should not say that we work a patient. Operate is a transitive and intransitive verb. A transitive verb is one that requires a direct object to complete its sense. Thus we may correctly say: "I operate a coal mine or a peanut stand or a cystoscope," "operate" being used as a transitive verb. In surgery, as far as the patient is concerned, operate is always intransitive. To satisfy our fondness for the use of the word operate and to use it correctly, we must limit our transitive use of the verb to operating the gas machine, the bone saw, the syrings, but we must not operate the patient.

The word "pathology" is defined by Dorland as "That branch of medicine which treats of the essential nature of disease, especially of the structural and functional changes, caused by disease." By a curious quirk, the original meaning has recently become dislocated from a study of diseased tissue to the disused tissue itself. We hear such expressions from the operating room and morgue as, "no pathology of the gall bladder found," "exploratory incision revealed no pathology," and examination of chest plates conclude with the statement "there is no pathology in the lungs. We might as well say that the larynx shows no laryngology, the bladder shows no urology.

The terms "tuberculous" and "tubercular" are hopelessly mixed up. "Tuberculous" should be limited to any lesion or process caused by the bacillus tuberculosis; "tubercular" should be restricted to a condition in which tubercles or nodules are present.

We aim at accuracy in medicine. Exactness is necessary in prescribing, correctness is desirable in diagnosis and accuracy is indispensable in surgery. May we not profitably give some attention to correctness in medical English?—Editorial, Surg. Gynec. and Obst, 49:397, 1929.

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THREE NEW ORLEANS DOCTORS HONORED

The very genial and charming ex-president of the Louisiana State Medical Society, Dr. Leon J. Menville, has again been honored by an elective position in one of the largest medical organizations of this country. Chosen as the Second Vice-President of the American Radiological Society, Dr. Menville undoubtedly received this honor for two reasons: in the first place, the personality of the man, coupled with persistent steady endeavors to improve his organization, to which may be added the second important reason, the ability to carry out scientific and experimental studies in roentgenology, shown by the fact that the paper that this new officer presented in Toronto was hailed as one of the finest scientific expositions of his specialty during the meeting. It is obvious that either of these factors, personality and scientific attainment, might have made Dr. Menville one of the Vice-Presidents of the organization, but when both are combined in one man, there can be no question whatsoever but that the American Radiological Society made a most happy and felicitous selection.

All that has been said about Dr. Menville may with equal truth be written about Dr. Isidore Cohn, who was selected as the Second Vice-President of the Southern Medical Association, the largest medical society in the United States with the exception of the American Medical Association. Dr. Cohn is a surgeon of skill, a scientist of repute, and a gentleman at all times agreeable, affable and willing to serve. He has attained a reputation not only as a result of his surgical ability, but also because of his interest in medical history and because of his great ability as a teacher of medical students. Among these latter, by his stimulating and impressive demonstrations and lectures, he has achieved great popularity. The honor which the Southern Medical Association has bestowed upon this surgeon is a well merited one, and the Association has honored itself in honoring him.

Since the time the above paragraphs were written, still a third honor has been conferred upon another surgeon of New Orleans. Dr. Urban Maes was elected Vice-President of the Southern Surgical Association. This also is a well merited honor. Dr. Maes has always been recognized as one of the outstanding surgeons of the City. His ability and his knowledge of surgical subjects is so well recognized, not only in our local medical circles, but also nationally, that during the war he attained almost the highest position that was accorded civilian surgeons, becoming a Corp Consultant in the last months of the War. Upon his return to this country,

Dr. Maes has received numerous honors, honors that came to him not only because of his popularity as a man, but also because of his unexcelled skill as a surgeon and his magnificent surgical judgment, without which a surgeon is more or less of a technician. There are many good surgeons, men who are able to work with rapidity and deftness when they are operating, but a surgeon to be great must be skilled in diagnosis and must have the supreme attribute of good judgment. Both of these qualifications Dr. Maes possesses to an extreme degree. It is no wonder that his surgical ability is recognized everywhere and appreciation of it so shown by the numerous honors he has received, honors which he would have attained sometime or another, but which have come to him early in life because of his personal charm.

CHARLES V. UNSWORTH

Organized Medicine in Louisiana lost one of its most enthusiastic advocates and workers when Charles V. Unsworth died in New Orleans on the ninth of December. Dr. Unsworth had been sick for only a few short days with lobar pneumonia, and was unable to conquer the lung infection.

Dr. Unsworth graduated from Tulane University in 1904, and the following year saw him actively engaged in fighting yellow fever. He gradually drifted into psychiatry, largely on account of his association with the Louisiana Retreat, where from 1912 until his death he held the position of Physician-in-Charge. Dr. Unsworth was also a member of the Hotel Dieu Staff and he helped to organize the Tuberculosis and Public Health Association of Louisiana. In addition to his scientific and professional attainments, he was always an ardent worker, not only in the ranks of organized medicine, but also as one of the Presidents who served well and faithfully the Louisiana State Medical Society.

The grim reaper has carried off another of our former Louisiana state presidents. Always an enthusiastic toiler for the advancement of organized medicine, the passing of Dr. Unsworth will mean a real loss to the medical profession, as well as an actual tragedy to those whom he was constantly helping.

GORGAS MEMORIAL INSTITUTE

The annual report of the Gorgas Memorial Institute discloses considerable activity in the work of this organization. The educational program is being carried through vigorously and intelligently. A health service to a group of some 40 leading papers of this country is a part of the campaign on health education. In addition to this a national essay contest is held yearly, open to the two upper classes of the high schools of the country, for the purpose of stimulating adolescent interest in health.

In the Department of Mosquito Control, certain sections of the country have been surveyed and reports have been made indicating lines of attack which should be followed in order to get rid of mosquitoes in the particular sections investigated. The Gorgas Memorial was given a laboratory building by the Republic of Panama early in January. The institution has made a most excellent selection of the new director, Dr. Herbert C. Clark, former head of the Department of Laboratories of the United Fruit Company. Under the energtic leadership of this splendid type of medical man and scientist, there is no question that the scientific aspects of medicine, particularly tropical medicine, will link up with the practical features in such a way that the people of Central America will reap tremendous benefit.

The Gorgas Institute, under the active management of Admirable Grayson, seems at last, after some years of feeling around, found its place in medicine. Its aims and endeavors should now progress by leaps and bounds.

HOSPITAL STAFF TRANSACTIONS

CHARITY HOSPITAL MEDICAL STAFF MEETING, DECEMBER 17, 1929.

The first case for discussion was presented by Dr. R. H. Turner. The patient, a colored female aged 36 years, had been in the hospital one month. For 5 weeks prior to her admission she had complained of epigastric pain following eating, and had occasionally noted that her stools were black. During this time she had lost 15 or 20 pounds. For the past 2 or 3 months her appetite had been poor and she complained of weakness. A gastro-intestinal series showed a filling defect on the greater curvature of the stomach, and near the pylorus a defect on both curvatures suggesting the possibility of an annular lesion. Wassermann was strongly positive. She received intensive anti-luetic treatment, consisting of mercury, bismuth, potassium iodid and neo-arsphenamine. Her gastric analysis showed an achlorhydria even following histamine. During her stay in the hospital occult blood was present in the stools the greater part of the time on a hemoglobin free diet. Another gastro-intestinal series showed the filling defect less marked but the annular lesion apparently increased, and on December 17 the annular lesion was more marked and the other defect perhaps slightly less. Physical examination showed an anemia, evidences of loss of weight, tenderness in the epigastrium and rigidity. No mass was palpable on admission. At the present time, however, the tenderness was gone and a mass could be felt at the level of the umbilicus to the left of the mid-line. This was movable from side to side. There was no glandular enlargement and the physical examination was otherwise negative. Anemia had not improved and the weight had remained constant. In view of the persistence of the roentgen-ray findings and the lack of improvement on anti-luetic treatment, the case was thought to be one of carcinoma of the stomach in a young woman.

Dr. J. H. Watkins showed two very interesting cases of tularemia. The first case, a white male aged 53 years, complained of fever, weakness and nodular lesions on the arms and hands. Three weeks previous to his admission he noticed a hard tender nodule on his right thumb, which appeared one week after he had skinned a rabbit. Twenty-four hours later he developed fever, nausea, and later the nodule became pustular and ulcerated. This has persisted to the present time, though it is improved. He then noticed enlargement of the glands in his right axilla. On physical examination the right axillary glands were found greatly enlarged, about the size of a lemon. There was also a purplish macular eruption over the back. The epitrochlear gland on the right side was about the size of a large bean. He had little fever, never over 100 degrees. The blood Wassermann was negative, and blood serum showed agglutination for B. tularense in dilutions of 1-50, 1-100, 1-200.

The second patient, a white female aged 37 years, had cleaned a rabbit and 24 hours later noticed general malaise, fever, anorexia, and nausea. This persisted for one week, and the patient was treated for grippe. At the end of the week the middle finger of the left hand began to hurt. It became swollen, hard, red and then developed a small pimple which ulcerated. Fever continued until one weeks ago. A pigmented lesion appeared on the hands and the glands enlarged in the left axilla. There were no other skin lesions. The temperature reached a maximum of 101 degrees. Agglutination was positive in dilutions of 1-50, 1-100, 1-200 for B. tularense. Dr. J. G. Stulb briefly discussed the case. Dr. J. H. Musser spoke of the four types of the disease, namely ulceroglandular, glandular, oculoglandular and typhoid (septicemic). All except the septicemic type have been seen in Charity Hospital.

Dr. Philip Jones presented a white male about 50 years of age who had been admitted to the hospital with orthopnea, general anasarca and marked anemia. The blood count showed 550,000 erythrocytes with a color index of 2. He showed a large liver and an enlarged heart. He received a blood transfusion and then was fed pancreas and full diet. The reticulocytes rose from 3 per cent to 11 per cent in 11 days. He remained on the pancreas diet for six weeks, but during the last three weeks there was no improvement in the blood condition. He was then put on liver, and the erythrocytes gradually rose to 3,500,000, when he was discharged. He returned again and this time because of history of diarrhea, with large bulky white stools, he was put on a sprue diet of protein, milk, gelatine, and bananas. Two weeks ago he returned complaining of weakness, numbness and tingling in the legs. The blood count was essentially normal. The condition was regarded as a sub-acute combined degeneration of the cord, though the absence of the vibratory sense was questionable. At all times this patient's gastro-analysis showed plenty of free HCL from 25 to 65. The question was as to the diagnosis between sprue and pernicious anemia. Dr. Daspit discussed the neurological aspect of the case. Dr. Jamison expressed his opinion that the diagnosis of pernicious anemia was very difficult with the presence of HCL. His opinion was that liver was

as good for sprue as for pernicious anemia, and regarded the case as one of sprue. Dr. Musser called attention to the early beneficial results of pancreas in this case, and thought that any of the visceral meats could be regarded as blood regeneratives.

A motion picture film was then shown through the compliments of Mr. Storey, showing the effect of drugs on gastro-intestinal motility.

Dr. Musser reported that the staff had been granted permission to hold evening meetings every other month, alternating with luncheon meetings at the Jung Hotel.

The annual election of officers followed. All officers were elected unanimously. Dr. J. A. Storck was elected Chairman, Dr. Adolph Noah was elected Vice-Chairman, and Dr. I. L. Robbins, Secretary.

WILLARD R. WIRTH, M. D.

THE CHARITY HOSPITAL SURGICAL STAFF.

After the usual business, the scientific session was opened by Dr. George Cronan who read the synopsis of the first case. This was a colored female who had been admitted to the gynecological service of the hospital. A few days after admission she was sent to the rest ward, and remained there about 38 days. At the end of this time she had shown very little or no improvement and was transferred back to the old service. Operation revealed a large cyst full of pus. She died of general peritonitis. Dr. C. H. Tyrone explained that the mass in this case was very high and therefore, not suitable to exploration from below. It was further pointed out that these cases differ from the ordinary cases, in that they are infected ovarian cysts and the temperature does not subside on resting. Under these conditions exploration becomes imperative.

The second case was that of a four months old white infant. After having been treated in the pediatric service for a while a diagnosis of bilateral mastoiditis was made and bilateral mastoidectomy performed. The child died 24 hours after operation. In the discussion that followed Dr. J. P. Palermo expressed an opinion that it is quite unusual to see mastoid infections in infants of this age, as these cells are not developed at this time. This opinion was concurred in by Dr. C. L. Cox. Although pus was found in this case the condition was thought to be an antrum infection.

An interesting case of intense jaundice over a period of several days was next presented. The patient was a white male, 45 years of age, who had suffered with indigestion for 12 years. He had been very carefully worked up, and among other things was found to have an icterux index of 100. Roentgen-ray showed no dye in the gall-bladder. At operation he was found to have a stricture in both the cystic and common ducts, the latter at the ampulla of Vatter. The gall-bladder was removed and a T drain put in the common duct through which great quantities of bile drained over a period of 54 days, the patient finally dying. Dr. Alton Ochsner who read the synopsis of this case pointed out (1) that one must always bear in mind the possibility of malignancy of the head of the pancreas in these cases, (2) that ether pneumonia usually comes on within the first 48 hours postoperatively, and (3) lung abscess may come on as the result of embolism. This latter condition may result as early as 8 to 12 hours postoperatively.

The final case was that of a negro female who had been admitted to the hospital after having been ill with intestinal obstruction for over 48 hours. She was very toxic and in very poor condition on admission. Fifty c. c. of perfringens antitoxin was given and a short time later she was explored. The obstruction was found in a mass of adhesions in the pelvis. It was not necessary to resect. Instead an ileostomy was performed through which a great deal of material drained. She died about 15 hours later. Dr. H. B. Gessner stressed the great importance of recognizing these cases early, and doing something almost as early. Dr. F. L. Loria pointed out that the case was on her last leg when admitted; as a matter of fact practically hopeless. He also recalled some experimental work by Martin recently, which tended to show that perfringens antitoxin in these cases was valueless. Dr. Alton Ochsner explained that in view of clinical experience the antitoxin should be given these cases, however admitting that it is not

certain that it is of any benefit. He next explained the value of roentgen-ray in the diagnosis of intestinal obstruction, and said that the fluid level may be detected as early as eight hours after the onset of the symptoms. The subject of digestive ferments was next dwelled on by Dr. Oschner. The reformation of adhesions can be prevented in 90 per cent of cases in the experimental animal. Dr. O. C. Cassegrain next stressed the matter of frequent enemas. If they continue to return clear he advises exploration.

FRANK L. LORIA, M. D.

VICKSBURG SANITARIUM AND CRAWFORD STREET HOSPITAL STAFF MEETING, DECEMBER 9, 1929.

Abstract: Carcinoma of the Rectum.—Dr. A. Street.

The patient, a white male, aged 64, clergyman, married, was admitted to the hospital October 1, 1929.

Chief Complaint—Constipation and partial incontinence of feces. Constipation has sharply increased during the last eight months; has one to three passages of jelly-like substance involuntarily each day; bowels will pass feces only after very large doses of cathartics. Has much right lower abdominal pain and soreness, and has had it for about twenty years. No blood in the stools. No bladder symptoms. No fever. Appetite and digestion good; no loss of weight.

Physical Examination—General physical examination shows nothing remarkable. Tonsils and most of teeth have been removed. Pupils equal and react well to light and accommodation. Blood pressure 140/90. Digital examination of rectum shows a firm mass partially occluding the lumen, just above level of prostate. Mass not fixed.

Proctoscopic Examination—The sigmoidoscope was passed through the involved segment. Rectum above growth appeared normal. The involved segment was about one and one-half inches long; the mucosa of this segment presented papillary areas which bled easily and were soft and friable. Sections easily taken with punch from upper and lower margins and mid-portion.

Laboratory—Urine showed a trace of albumin and some granular casts. Blood: Hemoglobin, 82; leukocytes, 8,600; with normal differential; no malaria found; Wassermann and Kahn tests negative.

Tissue Pathology: Papillary adenoma; much inflammatory tissue.

Procedure—In view of the clinical picture, it was felt that the diagnosis was carcinoma, and that the specimens removed through the proctoscope were from benign areas. As colostomy was contemplated, more sections were not removed.

Operation—On October 8, 1929, with a left muscle splitting incision, the hand was introduced and liver carefully palpated; no metastases were felt in it. There were palpable lymph nodes along the abdominal aorta. The middle portion of the rectum contained a cylindrical growth, very indurated, partially fixed, and extending from slightly below promontory to the recto-vesical fold. The peritoneum of the recto-vesical fold was studded with hard nodules, about one-fourth inch in diameter. Permanent colostomy was done.

Patient did not improve following colostomy and death occurred November 17.

Autopsy showed the tumor to have grown so rapidly as to entirely obliterate the pelvic cavity; lumen of rectum was entirely closed for one inch. This extension had occurred since the operation a little over five weeks previously. Metastases were present in the abdominal lymph nodes, in the liver and in the ribs.

Microscopic examination of tissue from growth and metastases showed gelatinous adeno-carcinoma: Group IV.

TRANSACTIONS OF ORLEANS PARISH MEDICAL SOCIETY

TRANSACTIONS OF ORLEANS PARISH MEDICAL SOCIETY.

CALENDAR.

January 3—Physiology Seminar, Tulane Medical School, 5 P. M.

January 6—Eye, Ear, Nose and Throat Hospital Staff, 8 P. M.

January 8—Touro Infirmary Staff, 8 P. M.

January 10—Physiology Seminar, Tulane Medical School, 8 P. M.

January 10—French Hospital Staff, 8 P. M.

January 10—Medical Reserve Corps Branch School, 8 P. M.

January 13—*Orleans Parish Medical Society.* Installation Meeting.

January 14—Baptist Hospital Staff, 8 P. M.

January 15—Charity Hospital Surgical Staff, 8 P. M.

January 16—I. C. R. R. Hospital Staff, 12 Noon.

January 16—Eye, Ear, Nose and Throat Club, 8 P. M.

January 17—Physiology Seminar, Tulane Medical School, 5 P. M.

January 17—Mercy Hospital Staff, 8 P. M.

January 20—Hotel Dieu Medical Staff, 8 P. M.

January 21—Charity Hospital Medical Section, Jung Hotel, 12 Noon.

January 24—Physiology Seminar, Tulane Medical School, 5 P. M.

January 24—Medical Reserve Corps Branch School, 8 P. M.

January 27—*Orleans Parish Medical Society.*

January 31—Physiology Seminar, Tulane Medical School, 5 P. M.

SECRETARY'S REPORT.

During the month of December the Society held one joint clinical meeting with the United States Marine Hospital Staff, Dec. 9, and one special meeting for the Stanford E. Chaillé Memorial Oration on Dec. 6.

At the clinical meeting the following interesting program was given:

1. Naso-pharyngeal Syphilis
   Presentation of four cases, Ass't. Surgeon O. F. Hedley, USPHS.
2. The Treatment of Chronic Arthritis
   Presentation of five cases, Ass't Surgeon K. R. Nelson, USPHS.
3. Chronic Osteomyelitis of the Jaw
   Presentation of case, Dental Surgeon O. Paquin, Jr., USPHS
4. Ruptured Duodenal Ulcer without previous gastrict symptoms
   Presentation of case, Ass't. Surgeon D. P. Ross, USPHS
5. Pyelitis
   Presentation of three cases, Ass't. Surgeon W. F. Ossenfort, USPHS

At the Stanford E. Chaillé Memorial Oration Dr. Willard C. Rappleye, Director of Study of the Commission on Medical Education, New Haven, Connecticut, was the orator, and gave a very interesting talk on "The Doctor and the Public."

There was a very good attendance at both meetings.

The regular scientific meeting scheduled for December 23 was dispensed with an account of confliction with the holidays.

During the first week of December the Society held its annual Longer Life Week. The Committee in charge of this health week worked hard, and the Society extends its thanks to them. The Society also wishes to express its thanks to the members taking part in the program making addresses during this week.

The annual election of Officers for 1930 was held Saturday, December 14. As there was no opposition very little interest was taken in the voting. The following officers were elected:

President—Dr. C. Greenes Cole.

First Vice-President—Dr. Emmett L. Irwin.

Second Vice-President—Dr. J. T. Nix.

Third Vice-President—Dr. Walter J. Otis.

Secretary—Dr. H. Theodore Simon.

Treasurer—Dr. John A. Lanford.

Librarian—Dr. Daniel A. Silverman.

ADDITIONAL MEMBERS BOARD OF DIRECTORS.

Dr. Erasmus D. Fenner

Dr. I. M. Gage

Dr. Louis Levy

Following the election the Annual Dinner of the Society was held at the Chess Club. The dinner was a testimonial dinner in honor of Dr. J. H. Musser, President of the American College of Physicians, and Dr. C. Jeff Miller, President-elect of the American College of Surgeons.

The third year of group insurance in the Orleans Parish Medical Society began December 5. The members carrying the insurance have been requested to send in their checks to cover the annual premium in order to facilitate the work in the office which is necessitated by sending out bills for each quarter.

The dues for 1930 are payable now. The membership is again requested to send in their annual dues, if possible, to curtail the work in the office.

The Installation Meeting to be held Monday, January 13, is expected to be very well attended, especially since the Women's Auxiliary has been organized in Orleans Parish.

It is with regret that we report the death of one of our Active Members, Dr. Charles V. Unsworth.

TREASURER'S REPORT

November

Actual book balance 10/31/29	$ 232.50
Receipts	796.92
	$1,029.42
Expenditures	637.00
Actual book balance 11/30/29	$ 392.42

LIBRARIAN'S REPORT

Twenty-eight books have been added to the Library during November. Of these 22 were received from the New Orleans Medical and Surgical Journal, and 6 by gift. These additions bring the total number of books in the Library to 15,200.

This is the busiest season in the year in the Library work. Reference calls are constant. The reading rooms are in use all day.

The Library has helped in Longer Life Week, by furnishing material for the talks to clubs and schools, statistics on the economic cost of illness, mortality from preventable diseases, etc.

H. THEODORE SIMON, M. D.,
Secretary.

NEW BOOKS—NOVEMBER, 1929.

Trumper—Memoranda of toxicology. 1929.
Joslin—Diabetic manual. 1929.
Ringer—Clinical medicine for nurses. 1929.
Rogers—Recent advances in tropical medicine. 1929.
Tweedy—Tropical obstetrics. 1929.
Far Eastern Assn. of tropical medicine Trans. 1927. v. 2.
Humphris—Artificial sunlight and its thereapeutic uses. 1929.
Terry—Introduction to study of human anatomy. 1929.
Rees—Health of the mind. 1929.
Hala—Principles of pathology. 1929.
Fulkerson—Gynecology. 1929.
Cope—Some principles of minor surgery. 1929.
Chandler—Hookworm disease. 1929.
Walsh—History of nursing. 1929.
Heberden—Introduction to study of physic. 1929.
Buchanan—Physical and biochemistry of bacteria. 1928.
Gunn—Pharmacology and therapeutics. 1929.
Marcovici—Handbook on diet. 1928.
Allemann—Medical interpreter. 1929.
Deaver—Surgical anatomy of human body. v. 2. 1926.
Rockefeller foundation—Annual report. 1928.
Blanc—Cystographie. 1926.
Darrach—Epidemic encephalitis. 1929.
American Pediatric Assn. Trans. 1929.
Frank—Female sex hormone. 1929.

LOUISIANA STATE MEDICAL SOCIETY NEWS

H. Theodore Simon, M. D., Associate Editor.

NOTICE TO MEMBERSHIP

Attention is called to the fact that the annual dues of the Louisiana State Medical Society for 1930 are $7.00 instead of $4.00. In order that you may be familiar with some of the reasons for this increase I desire to direct your attention to the following:

For the past several years the President and other officers of our State Society, in submitting their report, have impressed the necessity and need of increased finances. This was deemed advisable not only from our past experiences, but for future activities of our Society. Also our Budget and Finance Committee, who has entire jurisdiction of our finances, have from time to time impressed upon the organization the close approximation of our receipts and expenditures.

During the past several years the work of our Committee on Public Policy and Legislation has been markedly increased, and they have found their activities considerably handicapped by the lack of suitable funds for their expenditures. The Executive Committee found it necessary last year to levy a special assessment of $1.00 per capita to cover expenses of this Committee. Only a small percentage of the members responded to this assessment.

During the past two years the Society has been planning for the edition of the History of the Louisiana State Medical Society, which is being edited by Dr. Rudolph Matas. They were unable to finance the expenses for this plan in toto, which was supported by individual subscriptions to the book and by individual private subscriptions.

Your attention is called to the increased evaluation of our Journal, manifested by the additional number of original and scientific papers, increased number of pages, and other added attractions to enhance its scientific aspect. The Journal has thus increased in size and reading matter with the distinct change in its physical appearance for the better. This required additional expenditure of money, yet our organization has not been able to increase their allotment made to our Journal for this purpose for several years.

Various other phases of work which have been recommended have been found inexpedient owing to the lack of finances. Constructive plans for educational purposes and other plans of instructive medical activity have had to be held in abeyance. However, many added features of organized medicine for the individual good of its members have been put into effect, and yet no extra budget has been made for the care of such expenditures as may have been essential. The Society has thus been functioning for a long period, increasing its activities and benefits to its members and yet the annual dues continued to remain the same.

At the last meeting of the House of Delegates, upon recommendation of our Retiring President, the increase of dues was unanimously voted. They felt that this small increase in dues was incomparable with the services being rendered to the individual members and to take care of prospective plans for the future. It was the feeling that each and every member of the State Society would be desirous of taking a part in this work and aiding in what might be accomplished for the organization as a whole. Our State dues have been small in comparison with other State Medical Societies. It is a well known business fact that in the expansion or increase of benefits of an organization more money is required.

I hope that the above recitation of facts will give you some information as to the reasons found by the House of Delegates for the increase of our annual dues.

P. T. TALBOT, M. D.,
Secretary-Treasurer.

The following Parish Medical Societies have elected officers for 1930:

Bienville Parish: President, Dr. R. C. Ferguson, Arcadia; Vice-President, Dr. O. L. Kidd, Gibsland; Secretary-Treasurer, Dr. J. N. Blume, Arcadia; Delegate, Dr. J. L. Wade, Arcadia; Alternate, Dr. C. C. Allums, Ringgold.

Claiborne Parish: President, Dr. J. W. Featherstone, Homer; Vice-President, Dr. C. O. Wolff, Haynesville; Secretary-Treasurer, Dr. E. A. Campbell, Homer; Delegate, Dr. J. R. Turner, Homer; Alternate, Dr. F. Palmer, Homer.

DeSoto Parish: President, Dr. H. P. Curtis, Mansfield; Vice-President, Dr. B. K. Parrish, Mansfield; Secretary-Treasurer, Dr. D. C. McCuller, Mansfield; Delegate, Dr. W. B. Hewitt, Mansfield.

East and West Feliciana Bi-Parish: President, Dr. Glenn J. Smith, Jackson; Vice-President, Dr. S. L. Shaw, Cinton; Secretary-Treasurer, Dr. E. M. Toler, Clinton; Delegate, Dr. W. Lea, Jackson.

Lafourche Parish: President, Dr. I. J. Boulet, Lockport; Vice-President, Dr. L. E. Meyer, Thibodaux; Secretary-Treasurer, Dr. P. H. Dansereau, Thibodaux; Delegate, Dr. C. J. Barker, Thibodaux; Alternate, Dr. L. E. Meyer, Thibodaux.

Rapides Parish: President, Dr. J. A. White, Alexandria; Vice-President, Dr. J. A. Packer, Alexandria; Secretary-Treasurer, Dr. B. H. Texada, Alexandria; Delegates, Drs. R. O. Simmons, J. H. Landrum, Dr. E. DeNux; Alternates, Drs. J. N. Thomas, J. W. Phillips, M. H. Foster.

Terrebonne Parish: President, Dr. R. W. Collins, Houma; Vice-President, Dr. J. B. Duval, Houma; Secretary-Treasurer, Dr. S. F. Landry, Houma; Delegate, Dr. T. I. St. Martin, Houma.

Natchitoches Parish: President, Dr. J. P. Pratt, Natchitoches; Vice-President, Dr. C. R. Reed, Natchitoches; Secretary-Treasurer, Dr. W. W. Knipmeyer; Delegate, Dr. W. W. Knipmeyer, Natchitoches; Alternate, Dr. R. S. Roy, Natchitoches

CHARLES V. UNSWORTH

Whereas, God in His all-wise and righteous providence removed from us by death our beloved brother and co-laborer, Charles V. Unsworth, we the Seventh District Medical Society of Louisiana in regular meeting at Oakdale, La., bow in reverent and humble submission to His holy will.

Our hearts are sad because we will miss his valuable counsel, advice and willing hand in the great work in which we are engaged.

We cannot recount all the virtues of our friend and co-laborer, for they were many, and so beautifully exemplified for a long term of years.

It was his good fortune for many years to occupy position of great honor and trust.

We love to think that the service of Charles V. Unsworth was not half-hearted. He put his whole soul into his work and was ready and willing at all times to respond to the many calls for his time and talents.

In full realization of what his death will mean to the Louisiana State Medical Society, we, the members of the Seventh District Medical Society, adopt the following resolutions, as expressive, in part, of what is in our minds and hearts:

(1) That we bow in reverent and humble submission to the divine will in this dispensation of God's providence.

(2) That in the death of Charles V. Unsworth the Louisiana State Medical Society has lost one of its most loyal, exemplary and distinguished members.

(3) That we feel deeply the loss of our departed brother and co-laborer and fully realize the loss we have sustained in being deprived of his valuable counsel, advice, co-operation and sympathetic fellowship.

(4) That we extend to his family our heartfelt love and sympathy in this time of sorrow and bereavement, and pray that our God will ever sustain, lead and comfort them.

(5) That a copy of these resolutions be presented to the Society, one to the family and one to the Secretary of the Louisiana State Medical Society.

CLAUDE A. MARTIN, M. D.,
Chairman;
D. C. ILES, M. D.
T. H. WATKINS, M. D.

DR. JOHN SPELMAN

The many friends and former associates of Dr. Spelman were shocked to hear of his unexpected death in Pittsburgh. No details of his illness had been received on going to press. Dr. Spelman was for six years Superintendent of the Touro Infirmary. He was active in charitable and sociologic matters in both the city and State, and his leaving for wider fields two years ago was regretted by all who had come in contact with this splendid type of physician.

SOUTHERN BRANCH OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE

The first fall meeting of the Society for Experimental Biology and Medicine was held the last of October in the Richardson Memorial. Twelve papers were read at the meeting, all of them representing new observations on the scientific aspects of medicine.

There were present at the meeting fifty-three attendants. Included among the guests were Dr. J. Dormal of Belgium, a Belgian Relief Fellow, and Drs. Thomas E. Hunt and Franklin DuBois of the University of Alabama.

The Southern Branch of the Society, which has its headquarters in New York, and was founded by Dr. S. J. Meltzer, was started in Tulane University on the 29th of January, 1925. It is one of ten branches now actively functioning in the United States and in Peking, China. The Southern Branch covers the South, and certain other medical centers have become interested in the work that is being carried out by this organization, which has contributed 101 scientific contributions in the Proceedings of the Society.

MEETING OF ST. TAMMANY PARISH MEDICAL SOCIETY

The Society met on Friday night, December 13, at 8 P. M., in Covington, at New Southern Hotel. The Vice-President, W. F. Stevenson, presided in place of the President, T. Roland Young, who officiated as Secretary.

The attendance was very good and the following doctors answered roll call: F. F. Young, H. E. Gauthreaux, L. Roland Young, H. D. Bullock, J. F. Buquoi, G. McG. Stewart, and W. L. Stevenson of Covington; R. B. Paine, A. G. Maylie, Lawrence R. Young of Mandeville, and J. K. Griffith, J. K. Polk and F. R. Singleton of Slidell.

After the reading and adoption of minutes, business matters were taken up and then the election of officers was held Dr. H. E. Gautreaux was honored with the presidency, J. K. Griffith, Vice-President, and H. D. Bullock, Secretary-Treasurer.

R. B. Paine, with F. F. Young alternate, were elected delegates to the annual State Medical Convention to be held in 1930 in Shreveport, La. Dr. Young is on the program to address the State meeting at this time.

Dr. Lawrence Randolph Young of Mandeville was unanimously elected a member of the St. Tammany Parish Medical Society, heretofore having been a member of the Arcadia organization. The members at the next meeting, at which time the officers will be installed, will be banqueted at the new Southern Hotel, Covington. The President of the State Medical Association and other prominent doctors will be invited guests. This meeting will be held on the night of January 10.

L. ROLAND YOUNG,
Pres. and Act. Sec.-Treas.

MEETING OF THE EAST AND WEST FELICIANA PARISH SOCIETIES

The East and West Feliciana Bi-Parish Medical Society met in Clinton, La. Dr. Isidore Cohn of New Orleans was the essayist. Dr. Cohn gave a very instructive talk on "Clinical Chest and Abdominal Complications," which was discussed by physicians present. Dr. Cohn was voted a vote of thanks. Physicians present were: Drs. Isidore Cohn, Fields, Lorio, Chamberlin, Cook, McMahon, Smith, Miller, Lea, Gil, Merrell, Waltrip, Shaw, Wilkins, Sewell and Toler.

The following officers were elected for 1930: President, Dr. Glenn J. Smith; Vice-President, Dr. S. L. Shaw; Secretary-Treasurer, Dr. E. M. Toler. Following the meeting a banquet was held in the Rist Hotel.

MORTALITY STATISTICS

The Department of Commerce has issued a bulletin detailing the Louisiana mortality statistics for the year 1928. The death rate during this year was 1281.4 per 100,000 population, as compared with 1234.5 in 1927. There was an increase in the death rate for the following principal causes: diseases of the heart, 174 to 190; nephritis, 101 to 114; cerebral hemorrhage, 65 to 70; cancer, 67 to 69, and diabetes mellitus, 11.7 to 12.3 per 100,000. The rate for influenza was more than double of that of the preceding year 33 to 66. Increase in all forms of pneumonia occurred from 81 to 99. A rather striking feature of the report is the increase in death rate from automobile accidents, excluding collisions with railroad trains and street cars, which jumped from 15.3 to 17.8. Of great significance is the decrease in the rates of the diseases which are considered to be preventable. Tuberculosis fell from 98 to 92, diarrhea and enteritis of infants from 39.8 to 27.2, measles, diptheria, whooping cough, typhoid fever, malaria, were all diminished from 2 to 5 per 100,000 population. One of the sad features of the report is the fact that there has been no decrease worth mentioning in the death rate from puerperal septicemia and puerperal causes. They still remain very much higher than they should in a community highly civilized and well educated.

WEEKLY HEALTH INDEX OF NEW ORLEANS

The weekly health indices that have been received and have not yet been published give the following information. During the week ending November 16, in New Orleans, the total deaths numbered 134, with the death rate of 16.3. Thirteen of these deaths were in children under 1 year of age, giving an infant mortality of 65. This is the lowest death rate that has occurred in the city for many weeks, and may be contrasted to the corresponding week in 1928 when there were 169 deaths with a rate of 20.6. The next week, which ended November 23, finds a still present remarkably low death rate. During this week there were 138 deaths with a rate of 16.8, with but 10 children under 1 year of age dying during this period. The death rate in the next week jumped up considerably. The official report for the week ending November 30 showed that there were 169 deaths in New Orleans with a

rate of 20.6. The infant mortality rate was 74. The corresponding week of 1928 there were, however, 194 deaths with the rate 23.6. The report for the first week of December states that there were 179 deaths with rate of 21.8. Part of this increase may be attributed to the large number of small infants who died; 22 died in this period with a death rate of 109. During the corresponding week of 1928 the death rate was 18.3, total deaths numbering 150.

Members of the faculty of the Graduate School of Medicine of the Tulane University of Louisiana attending the meeting of the Southern Medical Association held at Miami, Fla., during the week beginning November 18, 1929, and presenting papers were as follows:

Prof. Elizabeth Bass—"A Case of Primary Tuberculosis of the Tongue Now Cured."

Prof. M. Earle Brown—"A Surgical Suggestion for the Glaucoma Problem."

Prof. Isidore Cohn—"Diminishing Morbidity and Mortality."

Prof. Allan S. Eustis—"The Relationship of Intestinal Toxemia to Allergy."

Prof. C. S. Holbrook—"Encephalitis Following Vaccination; Report of Two Cases."

PROGRAM FOR FIRST INTERNATIONAL MENTAL HYGIENE CONGRESS ANNOUNCED

Many subjects are listed on the program of the First International Congress on Mental Hygiene, just received from John R. Shillady, Administrative Secretary, 370 Seventh Avenue, New York City. Practically all aspects of mental hygiene will be covered at the Congress. Details of the program have been worked out by a committee of which Dr. Frankwood E. Williams, medical director of the National Committee for Mental Hygiene, is chairman, collaborating with correspondents in many countries. Topics are now ready for publication, and are contained in an informing, 33-page Preliminary Announcement, obtainable from headquarters office. The Congress will be held in Washington, D. C., May 5-10, 1930. As some of our readers know, President Hoover has accepted the honorary presidency of this Congress, and delegates are expected from more than thirty countries.

CORRESPONDENCE.

Alexandria, La., December 12, 1929.

Editor, New Orleans Medical and Surgical Journal, New Orleans, La.

Dear Sir:

In the discussion of Dr. Pierson's paper on "Legal Sexual Sterilization of Inmates of State Institutions," which appeared in the December, 1929, issue of the Journal, one of the individuals discussing this paper said in part:

> "Doctor, I wish you wouldn't keep quoting Dr. Treadgold (Tredgold). He has been dead for the last twelve years * * *"

This is an erroneous statement. Dr. A. E. Tredgold is alive and remains the leading authority on mental deficiency in the British Isles, and perhaps the leading authority in the entire world today. His opinion regarding sterilization remains unchanged. He states:

> "* * * that if every defective in existence a generation ago had been sterilized, the number of defectives today would not have been appreciably diminished, and that if every defective now existing were to be sterilized, the result a generation hence would be insignificant."

This extract is taken from an article by him in which his views on sterilization were concisely stated. An abstract of this article appeared in a letter from the London correspondent of the J. A. M. A. 87:17 (October 23) 1926.

This letter is written in an effort to keep the record straight, and I ask that you kindly publish same.

Very truly yours,

EDWIN M. LEVY, M. D.

MISSISSIPPI STATE MEDICAL ASSOCIATION NEWS

L. S. Lippincott, M. D., Associate Editor

EAST MISSISSIPPI STATE HOSPITAL.

In addition to the numerous improvements that have been made at the East Mississippi State Hospital, Meridian, the following program has been laid out and work is now under way to provide a complete power plant, ice plant, cold storage, kitchen, baker shop, and vegetable house, all completely equipped; new tunnels throughout the institution are now under construction, and new plumbing is to be installed from engine room to radiators. Improvements are also to be made in the laundry and lighting system. Dr. M. J. L. Hoye is superintendent.

Dr. H. H. Ramsey, Superintendent of the Mississippi School and Colony for the Feebleminded at Ellisville, writes the following:

"I am pleased that through the foresight and courtesy of Dr. W. D. Beecham, Director of the Forest County Health Department at Hattiesburg, the first mental clinic for school children will be held at the offices of the health department in Hattiesburg on December 14. In this clinic retarded and problem children will be given the mental test and psychiatric examination to determine the cause of their backwardness, maladjustment, or delinquency.

"I am making an effort to have passed in the next legislature which convenes in Jackson on January 7, a bill providing for one mental clinic connected with the institution here. This clinic would consist of a psychiatrist, a psychologist and a social worker, all specially trained in this field. This movement will not eliminate children from the classes in public schools, but by dealing with them early, we will have an opportunity to prevent their later social and economic loss as citizenship failures. As you know, the feebleminded child in classes in public school not only handicaps the normal child, but is himself a future social and economic loss which runs into big money. Mississippi has led the South in many great forward movements and I am hoping that we shall have the honor in being the first State in the South to provide statewide mental clinics in the public schools."

VICKSBURG HOSPITAL.

At the regular monthly meeting of the Staff of the Vicksburg Hospital, the following program was presented:

1. Resume of Industrial Surgical Reports compiled by the American College of Surgeons.—Dr. I. C. Knox.

2. Resume of Literature on Ascites.—Dr. W. H. Parsons.

3. The Use of Lipiodol in the Diagnosis of Spinal Cord Tumors.—Dr. G. P. Sanderson.

4. Discussion of the Causes and Treatments of Nasal Catarrh, Especially in Children.—Dr. E. H. Jones.

It has been announced that Dr. W. H. Weimar, Vicksburg, has been elected to the Staff of the Vicksburg Hospital.

TRI-COUNTY MEDICAL SOCIETY.

The regular meeting of the Tri-County Medical Society was held at Brookhaven, December 10. The following officers for the coming year were elected: President, Dr. W. L. little, Wesson; Vice-Presidents, Dr. E. H. Deherry, Hazlehurst, Copiah County; Dr. O. N. Arrington, Brookhaven, Lincoln County; Dr. R. E. Sylvestein, Tylertown, Walthall County; Dr. T. F. Conn, Silver Creek, Lawrence County; member of Medical Legal Committee Dr. H. R. Fairfax, Brookhaven; Secretary and Treasurer, Dr. J. R. Markette, Brookhaven.

Dr. R. S. Savage, recently located in Brookhaven, was married November 6, to Miss Ruth Brock of Magnolia.

Dr. F. E. Collins of Brookhaven is at Touro Infirmary, having undergone a surgical operation. His many friends are hoping that he will be able to resume his practice in a short time.

Dr. Wallace L. Britt has announced the removal of his office from the Century Building to the second floor of the Standard Life (Plaza) Building, Jackson.

Acknowledgement is made of the following reprints received during the month: "Open Operation in Fractures of the Shaft of the Femur," Dr. J. H. Rush, Meridian, and "Indications for Operation in Acute Mastoiditis," by Dr. Robin Harris, Jackson, Mississippi.

CLARKSDALE AND SIX COUNTIES MEDICAL SOCIETY.

The Fifty-fifth Semi-Annual Session of the Clarksdale and Six Counties Medical Society was held at Clarksdale on the afternoon and evening of November 6, with fifty-two members and twenty visitors present.

Officers for 1930 were elected as follows: President, Dr. L. B. Austin, Rosedale; Vice-Presidents, for Bolivar County, Dr. S. H. Brevard, Deeson; for Coahoma County, Dr. A. W. Rhyne, Coahoma; for Tallahatchie County, Dr. J. L. Harris, Swan Lake; for Tunica County, Dr. W. W. Nobles, Tunica; Secretary and Treasurer, Dr. D. V. Galloway, Clarksdale; member of the Board of Censors, Dr. T. G. Hughes, Clarksdale.

By vote of the Society, a telegram of sympathy was sent to Dr. J. P. Hitt, ill at the Baptist Hospital in Memphis.

A committee, consisting of Drs. S. W. Glass, chairman, T. M. Dye and E. LeRoy Wilkins, was appointed to draw up resolutions memoralizing the loss to the Society through the death of Dr. R. T. Stapleton of Tunica.

Three new members were ordered enrolled—Doctors G. C. Denson, Vance; Julius Levy, Clarksdale, and Robert T. McLauren, Clarksdale.

The Scientific Program was carried out as follows:

Tularemia.—Dr. H. L. Shannon, Clarksdale.

Dysentery.—Dr. D. O. Pierce, Jonestown.

Acute Intestinal Obstruction; Importance of Early Diagnosis.—Dr. S. D. Robinson, Clarksdale.

Injuries and Diseases of the Membrana-Tympani.—Dr. D. H. Griffin, Clarksdale.

President's address.—Dr. Hal Johnson, Dundee.

Proteotherapy.—Dr. J. W. Gray, Clarksdale.

Vincent's Infection.—Dr. G. G. Rudner, Memphis.

Vaccines and Serum Therapy.—Dr. Tom Mitchell, Memphis.

Spinal Anesthesia in Abdominal Operations.—Dr. Andrew B. Carney, Clarksdale.

Nasal Reflex Asthma.—Dr. R. W. Hooker, Memphis.

The sessions of the Society closed with a delightful banquet at which Dr. E. LeRoy Wilkins served as Toastmaster and Dr. Hugh A. Gamble, President of the Mississippi State Medical Association was the principal speaker. The next meeting of the Society will be held on March 26, 1930.

Dr. Hardie R. Hays has announced the opening of his offices at the Capitol City Clinic, 941 Robinson Street, Jackson, Mississippi. Dr. Hays will give special attention to genito-urinary diseases and syphilis. After January 1st, Dr. Hays will also maintain an office in the new Merchants Bank Building.

COMMITTEE ON LYE LEGISLATION.

Dr. E. F. Howard of Vicksburg, member for Mississippi of the Committee on Lye Legislation of the American Medical Association, Section of Laryngology, has asked each County Society to get actively behind the "Lye Bill" which is the proposed uniform State Law to safeguard the distribution of lye and other caustic substances in containers for household use, as prepared under the direction of the Committee on Lye Legislation, of which Doctor Chevalier, Jackson, is chairman.

Congress has passed a similar law to cover interstate traffic and the following states have already enacted legislation regulating the sale of lye and the laws in most of these states follow the provisions of the Uniform State Bill:

Alabama, Arizona, Colorado, Delaware, Florida, Iowa, Kansas, Louisiana, Maryland, Massachusetts, Minnesota, Nevada, New Hampshire, New Jersey, Oregon, Pennsylvania, South Carolina, Vermont, Virginia, Washington, West Virginia, and Wisconsin.

It certainly behooves the doctors of Mississippi to see that the people of the State and especially the children are protected as provided by the proposed law. The bill to be presented to the Legislature is as follows:

A Bill to Safeguard the Distribution and Sale of Certain Dangerous Caustic or Corrosive Acids, Alkalis, and Other Substances in the State of Mississippi.

Be it enacted . . . (The phraseology of the enacting clause should conform to the phraseology customary in the State in which legislation is proposed) . . .

That is this act, unless the context or subject-matter otherwise requires.

A. The term "dangerous caustic or corrosive substance" means each and all of the acids, alkalis, and substances named below: (a) Hydrochloric acid and any preparation containing free or chemically unneutralized hydrochloric acid (HCL) in a concentration of ten per centum or more; (b) Sulphuric acid and any prepartion containing free or chemically unneutralized sulphuric acid (H2SO4) in a concentration of ten per centum or more; (c) Nitric acid or any preparation containing free or chemically un-

neutralized nitric acid (HNO_3) in a concentration of five per centum or more; (d) Carbolic acid (C_6H_5OH), otherwise known as phenol, and any preparation containing carbolic acid in a concentration of five per centum or more; (e) Oxalic acid and any preparation containing free or chemically unneutralized oxalic acid ($H_2C_2O_4$) in a concentration of ten per centum or more; (f) Any salt of oxalic acid other than cerium oxalate and any preparation containing any such salt in a concentration of ten per centum or more; (g) Acetic acid or any preparation containing free or chemically unneutralized acetic acid ($HC_2H_3O_2$) in a concentration of twenty per centum or more; (h) Hypochlorous acid, after free or cimbined, and any preparation containing the same in a concentration so as to yield ten per centum or more by weight of available chlorine, excluding calx chlorinata, bleaching powder, and chloride of lime; (i) Potassium hydroxide and any preparation containing free or chemically unneutralized potassium hydroxide (KOH), including caustic potash and Vienna paste, in a concentration of ten per centum or more; (j) Sodium hydroxide and any preparation containing free or chemically unneutralized sodium hydroxide (NaOH), including caustic soda and lye, in a concentration of ten per centum or more; (k) Silver nitrate, sometimes known as lunar caustic, and any preparation containing silver nitrate ($AgNO_3$) in a concentration of five per centum or more, and (l) Ammonia water and any preparation yielding free or chemically uncombined ammonia (NH_3), including ammonium hydroxide and "hartshorn," in a concentration of five per centum or more.

B. The term "misbranded parcel, package, or container" means a retail parcel, package, or container of any dangerous caustic or corrosive substance for household use, not bearing a conspicuous, easily legible label or sticker, containing (a) the name of the article; (b) the name and place of business of the manufacturer, packer, seller, or distributor; (c) the word "POISON," running parallel with the main body of reading matter on said label or sticker, on a clear, plain background of a distinctly contrasting color, in uncondensed gothic capital letters, the letters to be not less than 24 point size, unless there is on said label or sticker no other type so large, in which event the type should be not smaller than the largest type on the label or sticker, and (d) directions for treatment in case of accidental personal injury by the dangerous caustic or corrosive substance: Provided, that such directions need not appear on labels or stickers on parcels, packages, or containers at the time of shipment or of delivery for shipment by manufacturers or wholesalers for other than household use.

Section 2. No person shall sell, barter, or exchange, or receive, hold, pack, display, or offer for sale, barter, or exchange, in the State of Mississippi any dangerous caustic or corrosive substance in a misbranded parcel, package, or container, said parcel, package, or container being designed for household use; provided, that household products for cleaning and washing purposes, subject to this act an labeled in accordance therewith, may be sold, offered for sale, held for sale and distributed in this State by any dealer, wholesale or retail; provided further, that no person shall be liable to prosecution and conviction under this act when he establishes a guaranty bearing the signature and address of a vendor residing in the United States from whom he purchased the dangerous caustic or corrosive substance, to the effect that such substance is not misbranded within the meaning of this act. No person in this State shall give any such guaranty when such dangerous caustic or corrosive substance is in fact misbranded within the meaning of this act.

This act is not to be construed as applying to any substance, subject to the act, sold at wholesale or retail for use by a retail druggist in filling, or in dispensing in pursuance of a prescription by a physician, dentist or veterinarian; or for use by a chemist in the practice or teaching of his profession; or for any industrial or professional use or for use in any of the arts and sciences.

Section 3. Any dangerous caustic or corrosive substance in a misbranded parcal, package, or container suitable for household use, that is being sold, bartered, or exchanged, or held, displayed, or offered for sale, barter, or exchange, shall be liable to be proceeded against in any (insert name of state court having jurisdiction in condemnation procedures of like character) . . . Within the jurisdiction of which the same is found . . . (This clause is unnecessary if there is but one such court, but provision should be made for as wide jurisdiction as practicable, so as to facilitate procedure) . . . and seized for confiscation by a process of libel (the specification of the process to be followed should be made to conform to local State practice) . . . and if such substance is condemned as misbranded by said court, it shall be disposed of by destruction or sale, as the court may direct; and if sold, the proceeds, less the actual costs and charges, shall be paid over to the (insert name of proper State officer to receive such

funds) . . .; but such substance shall not be sold contrary to the laws of the State: Provided, however, that upon the payment of the costs of such proceedings and the execution and delivery of a good and sufficient bon to the effect that such substance will not be unlawfully sold or otherwise disposed of, the court may by order direct that such substance be delivered to the owner thereof. Such condemnation proceedings shall conform as near as may be to proceedings in (State as nearly as may be the procedure to be followed).

Section 4. Any person violating the provisions of this act shall upon conviction thereof be punished by a fine of not more than two hundred dollars, or by imprisonment for not more than ninety days, or by both such fine and imprisonment, in the discretion of the court;

Section 5. The (Insert name of proper State officer of department) . . . shall enforce the privisions of this act, and he is hereby authorized and empowered to approve and register such brands and labels intended for use under the provisions of this act as may be submitted to him for that purpose and as may in his judgment conform to the requirements of this statute: Provided, however, that in any prosecution under this act the fact that any brand or label involved in said prosecution has not been submitted to said (Insert title of officer named above) . . . for approval, or if submitted, has not been approved by him, shall be immaterial.

Section 6. Every (Insert name of proper prosecuting officer) . . . to whom there is presented, or who in any way procures, satisfactory evidence of any violation of the provisions of this act shall cause appropriate proceedings to be commenced and prosecuted in the proper courts, without delay, for the enforcement of the penalties as in such cases herein provided.

Section 7. This act may be cited as the Mississippi Caustic Poison Act (Insert year of enactment) . . ."

Section 8. This act shall take effect six months after the date of its enactment.

Section 9. That from and after the date when this act takes effect, the following acts and all other acts contrary to and inconsistent with the provisions of this act be and the same hereby are repealed: (Insert names of acts to be expressly repealed, if any) . . . but nothing herein contained shall be construed as modifying or interfering with the institution or continuance of any prosecution based upon any violation of law committed before the passage of this act, nor with the enforcement of the penalties provided for any such violation by any act hereby repealed.

CONFERENCE OF HEALTH OFFICERS AND SANITARY INSPECTORS.

The Seventeenth Annual Conference of Health Officers and Sanitary Inspectors was held at the Edwards Hotel, Jackson, on December 11-12. Following is the program:

December 11, 9 A. M.

1. Meeting called to order—D.. Felix J. Underwood.
2. Invocation—Rev. D. A. McCall
3. How to Formulate a Practical and Effective Program for County Health Departments—Dr. J. H. Janney, Indianola.
   Discussion opened by Dr. J. T. Googe, Meridian.
4. Status of Mouth Hygiene Work in Mississippi—Miss Gladys Eyrich, Jackson.
   Discussion opened by Dr. Wm. R. Wright, Jackson.
5. A Practical Program for a Part-time Health Officer—Dr. R. E. Giles, Mendenhall.
   Discussion opened by Dr. W. S. Lampton, Magnolia.

LUNCH.

Afternoon Session—2:00 P. M.

1. A Practical Malaria Control Program for a County Health Department—Dr. R. D. Dedwylder, Cleveland.
   Discussion opened by Dr. Mark F. Boyd, Jackson.
2. Practical Screening Technic—Dr. C. P. Google, Greenwood.
   Discussion opened by Mr. J. A. LePrince, Memphis, Tenn.
3. An Economical and Effective Program for the Control of Diphtheria by a County Health Department—Dr. J. A. Milne, Hazlehurst.
   Discussion opened by Dr. T. J. Brown, Grenada.
4. Essential Epidemiological Investigations and Records for the Control of Preventable Diseases—Dr. H. L. McCalip, Yazoo City.
   Discussion opened by Dr. H. C. Ricks, Jackson.

Evening Session.

Dr. Felix J. Underwood, presiding.

1. Address by Dr. W. A. Evans, Chicago, Ill.
2. County Tuberculosis Clinics—Dr. Henry Boswell, Sanatorium.

December 12, 9 A. M.

1. Address—Governor Theo. G. Bilbo.
2. The Role of the Preventorium in the Prevention of Tuberculosis—Dr. Henry Boswell, Sanatorium.

   Discussion opened by Dr. B. T. Robinson, New Augusta.
3. Results of the Operation of the Standard Milk Ordinance.—Mr. A. W. Fuchs, Jackson.

   Discussion opened by Dr. T. Paul Haney, Lexington.
4. The Education of the Negro Race in Public Health Measures—Dr. W. E. Noblin, Jackson.

   Discussion opened by Dr. F. Michael Smith, Vicksburg.

LUNCH.

Afternoon Session—2:00 P. M.

1. Present Program and Plans for Future Development of the Bureau of Industrial Hygiene—Dr. J. W. Dugger, Jackson.
2. Better Birth and Death Registration of Mississippi—Dr. R. N. Whitfield, Jackson.
3. Explanation of Items on Monthly Report Forms—Dr. C. C. Applewhite, Jackson.

VISITORS TO THE MISSISSIPPI STATE BOARD OF HEALTH.

During October and November the following visited the State Board of Health for the purpose of looking over and studying the work being done in Mississippi:

Dr. T. A. Pincock, Department of Health, Winnipeg, Mannitoba, Canada.

Dr. J. W. Williams, Parish Health Officer, Monroe, Louisiana.

Mr. A. West, Sanitary Inspector, Monroe, Louisiana.

Dr. M. C. Balfour, Associate Director, International Health Division of Rockefeller Foundation, New York, N. Y.

Dr. L. T. Browning, County Health Officer, Logan, W. Va.

Dr. Lewis C. Coleman, County Health Officer, Harrodsburg, Ky.

B. C. Johnson, Sanitary Inspector, Jackson, Ky.

John Ault, Jr., Sanitary Inspector, Grayson, Ky.

Dr. G. W. Kirk, Sheppardsville, Ky., County Health Officer.

Dr. W. H. Stewart, County Health Officer, Louisville, Ga.

Dr. A. A Whittmore, State Health Officer, Bismarck, N. D.

Miss Lula M. Mitchell, Children's Bureau, Washington, D. C.

Dr. John A. Ferrell, International Health Division, Rockefeller Foundation, New York.

Dr. Wade H. Frost, Johns Hopkins University, Baltimore.

Dr. L. L. Lumsden, Sr. Surgeon, U. S. Public Health Service, Washington.

Dr. M. H. Jensen, Parish Health Officer, Lake Providence, La., visited the training station for health workers at Indianola.

His many friends throughout the state will be delighted to know that Dr. Felix J. Underwood, Executive Officer of the Mississippi State Board of Health, who has been ill for several months, is now able to be out and to devote a part of his time to official duties.

The Pike County Medical Society met in the Palm Room of the McColgan Hotel, McComb, December 5, with seventeen out of its twenty-two members present. Papers were read by Dr. W. M. Biggs, Osyka, and Dr. G. W. Robertson, Magnolia Meetings are held the first Thursday night of each month.

Dr. Clyde Chisholm Ratcliff, son of Dr. M. D. Ratcliff, McComb, died in St. Louis, of pneumonia on November 8. He was completing a senior interneship.

Dr. E. F. Howard, Vicksburg, furnishes the folliwing:

"For the information of our good friend Cooper of Meridian, you might announce the recent 'second crop' harvest. With the arrival of Miss Mary Frances Dent, November 21, Dr. B. B. Martin of Vicksburg has qualified in the grandfather class. The doctor is doing as well as could be expected."

Dr. J. C. Branham, graduate of Columbia University, and formerly resident physician at the 5th Avenue and United States Public Health Service Hospitals at New York, and the Jackson Memorial Hospital at Miami, Florida, is now resi-

dent surgeon at the South Mississippi Charity Hospital.

U. S. VETERAN'S HOSPITAL

Dr. George M. Melvin, a native of Mississippi and a former clinical director of the U. S. Veteran's Hospital at Gulfport, has returned to Mississippi and is now medical officer in charge of that station.

Dr. Harry H. Botts has been transferred to the U. S. Veteran's Hospital at Gulfport, as clinical director.

Dr. E. McCann has been on annual leave in northern Mississippi visiting relatives and friends.

TRI-COUNTY MEDICAL SOCIETY

Whereas, it has pleased the Almighty Father in His Infinite Wisdom to remove from his earthly field of labor and usefulness our worthy and beloved fellow member, Doctor John H. Johnson, and,

Whereas, his walks in life as physician, citizen and in the service of the nation while in war as well as in peace are worthy of emulation by all, his going is a distinct loss to this Society of which he was a loyal charter member; there be it

Resolved by The Tri-County Medical Society ish the memory of his friendship and his high and that we sincerely regret his passing; that we cherish the memory of his friendship and his high and ethical ideals, and that we extend to the sorely bereaved family our deep and heartfelt sympathy in this sad dispensation.

Resolved, that a copy of these resolutions be spread upon the minutes of this Society, a copy be sent to the sorrowing family, and a copy be sent to the local press and to the New Orleans Medical and Surgical Journal.

Adopted December 10. 1929.
Tri-County Medical Society,

B. S. WALLER, M. D.,
President.
J. R. MARKETTE, M. D.,
Secty-Treas.
W. L. LITTLE, M. D.,
W. H. FRIZELL, M. D.,
Committee.

An active staff has been organized at Dr. Roland Cranford's Hospital. This institution has been renovated and enlarged and is now open.

Dr. H. G. McCormick of Laurel has returned from a hospital stay at Hot Springs and is able to be in his office again.

FROM MERIDIAN

Dr. I. W. Cooper, Meridian, furnishes the following:

Drs. W. G. Gill, Newton; Olin Parks, Louisville; E. S. Richardson, Louisville, and I. W. Cooper, Meridian, were the members of the East Mississippi Medical Society who attended the meeting of the Southern Medical Association at Miami. They all had a wonderful time.

The meeting of the East Mississippi Medical Society was held at Meridian December 19, at which time officers were elected. The physicians of Meridian tendered the visiting physicians a banquet.

Drs. J. E. McDill and J. O. Segura of Jackson, spent Thanksgiving Day in the best city of the State. They were here with their sons, who are members of the Jackson football team. Their visit here was greatly enjoyed by their friends.

We are all very glad to see Dr. Felix Underwood, of our State Health Board, was able to attend the meeting of the Southern Medical Association at Miami. Dr. Underwood has had a long siege with undulent fever, but we are very much gratified that he is just about well and able to take up some if his work again.

Mrs. T. D. Bourdeaux, wife of Dr. Bourdeaux, has been sick in the Meridian Sanitorium for about three weeks with typhoid fever. The last report from her bedside is that she is rapidly improving and will soon be well again.

The writer has just been out and inspected the Children's Hospital being built by Dr. F. G. Riley. This building is going to be the last word in hospitals for sick babies. Every convenience is there which will enable Dr. Riley to handle these cases in the most scientific way. From the present outlook he will be able to move in about February 1, 1930.

Herewith you will find enclosed a report of the Staff Meeting of Anderson Infirmary, held December 13. The following special case reports were presented:

Indications for Tonsillectomies—Dr. H. L. Arnold.

Syphilis—Dr. T. A. Strain.

Malaria—Dr. W. Jeff Anderson.

Cardiac Diseases—Dr. T. G. Cleveland.

Discussion of a Hospital Death—Dr. W. Jeff Anderson.

The following selected radiographic studies were presented by Dr. C. R. Stingily: Fractured Skull (two cases), Osteo-Arthritis, Early Pulmonary Tuberculosis, Late Pulmonary Tuberculosis.

The Tupelo Hospital Staff met on December 3, and a scientific program was presented.

13-COUNTIES MEDICAL SOCIETY

A meeting of the 13-Counties Northeast Mississippi Medical Society was held at Tupelo on December 10, and proved to be one of the most interesting and successful in some time. Included among the guests of the Society were Dr. Carrol W. Allen, New Orleans; Dr. O. S. McCowan, Memphis, and Dr. Seale Harris, Birmingham. Officers were elected and the meeting was closed with a banquet

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Among those attending the recent meeting of the American College of Surgeons at Chicago were: Drs. M. H. McRae, Corinth; V. B. Philpot, Houston; W. H. Sutherland, Booneville, and W. C. Brewer, Columbus. Dr. Sutherland and Dr. Brewer also attended the meeting of the Inter-State Post Graduate Medical Association at Detroit.

SOUTH MISSISSIPPI MEDICAL SOCIETY.

The meeting of the South Mississippi Medical Society was held at the Nurses' Home, South Mississippi Charity Hospital, Laurel, on December 12. After a business meting at which officers for the coming year were elected, the following scientific program was carried out:

Treatment of Sepsis Following Labor.—Dr. H. L. McKinnon, Hattiesburg. Discussed by Drs. T. Ross and R. H. Cranford.

Treatment of Lobar Pneumonia.—Dr. H. P. Smith, New Augusta. Discussed by Drs. G. E. Eddy and Harelson.

Diagnosis of Appendicitis, Acute and Chronic. —Dr. C. C. Hightower, Hattiesburg. Discussed by Drs. W. N. Blount and R. H. Cranford.

The Disappearing Small Town and Country Doctor.—Dr. J. H. Newcomb, Richton.

General Discussion.

Immediately following the Scientific Program, dinner was served.

WINONA DISTRICT MEDICAL SOCIETY.

The Winona District Medical Society held its meeting in Grenada on November 19. Following a luncheon at the Grenada Clinic, the following program was presented:

Simplicity of Infant Feeding.—Dr. F. S. Hill, Grenada.

Tropical Sprue.—Dr. W. T. Swink, Memphis.

Indications for Roentgen-Ray and Radium in the Gynecologic Pelvis.—Dr. W. S. Lawrence, Memphis.

Tumors of the Breast.—Dr. J. A. Crisler, Jr., Memphis.

Each paper was followed by a round table discussion, participated in by all present.

ISSAQUENA-SHARKEY-WARREN COUNTIES MEDICAL SOCIETY.

The Annual Meeting and Banquet of the Issaquena-Sharkey-Warren Counties Medical Society was held at the Y. M. C. A., Vicksburg, on December 10. Invocation was said by Rabbi Sol Kory, Vicksburg. During the banquet short talks were made by Dr. G. W. Gaines, Tallulah, Louisiana; Dr. D. J. Williams, Gulfport, Chairman of the Council of Mississippi State Medical Association; Dr. D. W. Jones, Jackson, Councilor for the Fifth District and Secretary of the Council for the Mississippi State Medical Association; and Dr. F. J. Underwood, Executive Officer of the State Board of Health.

The Scientific Program consisted of two outstanding addresses:

A Discussion of Some of the Newer Remedies and Methods of Treatment for Malaria.—Dr. C. C. Bass, New Orleans.

The Cause and Treatment of Arterial Hypertension.—Dr. J. S. McLester, Birmingham.

Officers for the coming year were elected as follows: President, Dr. L. J. Clark, Vicksburg; Vice-Presidents: From Issaquena County, Dr. W. H. Scudder, Myersville; from Sharkey County, Dr. H. S. Goodman, Cary; from Warren County, Dr. P. S. Herring, Vicksburg; Secretary-Treasurer, Leon S. Lippincott, Vicksburg. Member of the Board of Censors, Dr. W. C. Pool, Cary; Member of Committee on Medical Defense, Dr. E. F. Howard, Vicksburg. Delegates to the Mississippi State Medical Association: For Issaquena County, Dr. J. W. B. Benton, Valley Park; from Sharkey County, Dr. A. K. Barrier, Rolling Fork; from Warren County, Dr. E. F. Howard, Vicksburg.

VICKSBURG SANITARIUM.

The Regular Monthly Meeting of the Staff of the Vicksburg Sanitarium and Crawford Street Hospital was held December 9.

Special case reports presented:

Gumma of the Supraclacicular Nodes.—Dr. G. M. Street.

Carcinoma of the Rectum.—Dr. A. Street.

Cellulitis of the Right Inguinal Region Simulating Pott's Disease.—Dr. J. A. K. Birchett, Jr.

The Value of Glucose Solution Intravenously in General Peritonitis; Case Illustration.—Dr. H. H. Johnston.

Special Report: The Recent Meeting of the Southern Medical Association at Miami.—Dr. A. Street.

Election of Officers for 1930 resulted as follows: President, Dr. L. J. Clark; Vice-President, Dr. J. A. K. Birchett, Jr.; Secretary, Dr. Leon S. Lippincott.

BOOK REVIEWS

Human Helminthology: By Ernest Carroll Faust, Ph. D. Philadelphia, Lea & Febiger. 1929. pp. xxii+616.

This book is a valuable addition to the literature of both medical science and zoology. The sub-title, "A Manual for Clinicians, Sanitarians, and Medical Zoologists," gives only a partial idea of the scope of the work for the handling of biological principles is much more thoroughgoing than that which is found in most parasitological manuals, and the author has condensed into small compass a remarkable amount of material which is of interest not only to the medical profession but also to general biologists.

The subject-matter is divided into four parts. A short introductory section entitled "The Scope of Helminthology" deals with the general phenomena of parasitism, host-parasite relationships, history of helminthology, the laws of zoological nomenclature, the literature of helminthology, etc. Sections II and III, which occupy the major portion of the book, present a systematic survey of the flatworms and roundworms parasitic on Man, in which the synonomy, morphology, life processes, geographic distribution, pathogenicity, diagnosis, therapeusis, and prophylaxis of each species are discussed concisely. Section IV, which is devoted to diagnostic methods, deals not only with helminthic infestations in Man, but includes a valuable chapter on intermediate and reservoir hosts.

A clear and readable literary style and a large number of good illustrations are attractive features of the book. Many of the figures are original drawings by the author. There is a selected bibliography at the end of each chapter and a very complete index.

E. S. HATHAWAY, M. D.

Principles of Pathology for Practitioners and Students: By H. D'Arcy Powers, M. D., F. R. P. S. and William W. Hala, M. D. New York, D. Appleton & Co., 1929. Pp. 787

This treatise on pathology is divided into two distinct parts as though two volumes had been incorporated in one binding. Part I is entitled "General Pathology," and accounts for about 200 of the 790 pages. Its chapters are devoted to such subjects as "Inflammations," "Retrogressions—Degenerations," "Causes of Diseases," etc. In them, general pathological considerations are discussed in a vague and rambling fashion which we do not feel can impress in a satisfactory manner, either the general practitioner, or the student for whom the authors state that the work is intended. The discussion of tumors is based on the classification of Adami, which, while it has much to recommend it, appears impractical and intricate at this time when the tendency is towards simple, workable systems. We feel that this chapter especially would leave those for whom the book is intended with most confused impressions.

Part II is entitled "Systemic Pathology" and is far more valuable than Part I. A chapter is devoted to each to the physiological systems. Each organ is reviewed separately, and the various types of pathology which may involve it are discussed in detail. The descriptions of the gross appearance of the organs at autopsy are excellent. The authors fortunately made every effort to correlate pathological findings with clinical data, and in many cases complete case histories are given.

The illustrations, which number 298, are most disappointing. They consist for the most part of extremely crude mostly diagramatic sketches. There are also included some poorly executed photo-micrographs, and photographs of gross specimens, which do not add to the value of the book, or the presentation of the matter.

We cannot see where this treatise makes any important contribution to the literature of pathology. There are other books on the subject which certainly better satisfy the requirements of the general practitioner and the student.

ADELAIDE MARY ZOELLER, M. D.

The Conquest of Cancer by Radium and Other Methods: By Daniel Thomas Quigley, M. D., F. A. C. S. Philadelphia, F. A. Davis Co. 1929. pp. 539.

This is a concise volume, well illustrated with 334 engravings. The introduction gives a history of cancer from the ancients known as the "Stinking Death" to the present day.

The first three chapters deal with the factors leading up to cancer, the fourth with classification of cancers and tumor growth.

The remainder of the book deals with clinical diagnosis, treatment and prognosis of the various cancers as they affect different organs and tissues.

This is the work of a master of his subject, can be read with interest by the layman and is invaluable to the medical profession.

It is not intended for the trained specialist because technical treatise of cancer has been simplified to meet the man who sees the cancer in its early and amenable stage. The F. A. Davis Co. should be complimented on the selection of the author and volume.

M. T. VAN STUDDIFORD, M. D.

American Illustrated Medical Dictionary: Edited by W. A. Newman Dorland, A. M. M. D., F. A. C. S. Fifteenth edition, revised and enlarged with collaboration of E. C. L. Miller, M. D. Philadelphia, W. B. Saunders Co. 1929. Pp. 1,427.

The American Illustrated Medical Dictionary, edited by Dr. Newman Dorland, is too well known to need an introduction to the medical profession.

In this edition several thousand of the newest medical terms have been added, a careful revision has been given to wording of the definitions, the terms of anatomy, pathology, physiology and physical therapy receiving special attention.

A definite standard in terminology, spelling, hyphenization, etc., has been established in this volume. The entire volume has been re-edited by the editorial staff of the American Medical Association. Official nomenclatures of such bodies as the American Chemical Society, the Council on Pharmacy and Chemistry, the Association of Pathologists and Bacteriologists, and the American Radiological Association, have been followed.

The book amply fills the need of a good, modern, medical dictionary for the doctor's desk.

MARY LOUISE MARSHALL.

Diagnosis and Treatment of Deformities in Infancy and Early Childhood: By M. F. Forrester-Brown, M. S., M. D. (Lond.), with a foreword by Sir Robert Jones, London, Oxford University Press, 1929. Pp. 199.

This book will be found to be of interest to the general practitioner or to the student of orthopedic surgery.

Dr. Robert Jones in his foreword truly says that "it is especially intended for the school doctor, the general practitioner and those interested in welware work."

It is too elementary for the general surgeon, but can be used to advantage by graduate nurses. The book is well illustrated.

EDWARD S. HATCH, M. D.

An Introduction to Pharmacology and Therapeutics: By J. A. Gunn, M. D., D. Sc (Edin.); M. A. (Oxon.) New York, Oxford University Press. 1929. Pp. 220.

The author says in his introduction that owing to the increasing demands on the medical curriculum, his yearly number of lectures in pharmacology and pharmacy has been limited to 50. A curtailed number of lectures such as this permits of not more than a general sketch of the subject. It is his purpose in presenting this small handbook to provide the student with a short and comprehensive survey of the whole subject so that the lecturer could have greater freedom and more latitude to present the more advanced aspects of the subject. This little book then is supposed to be read by the student so that he may familiarize himself with the more important facts before attending the lecture. The lecturer then can discuss his subject with a group who are not completely ignorant of the important data concerning drugs. This seems like a most excellent suggestion. From a rather superficial survey of the volume, most of the essential features concerning drugs have been presented. The book may be recommended furthermore to those who wish to make a rapid review of the action of various gal lencials, chemicals and biological preparations in the treatment of disease.

J. H. MUSSER, M. D.

Clinical Medicine For Nurses: By Paul H. Ringer, A. B., M. D. Philadelphia, F. A. Davis Company. 1929. Pp. 330.

It is always somewhat difficult to know just how much should be incorporated in lectures to nurses or in text books for their use. One can give a mere smattering of the subject of medicine which will be of little value. On the other hand, it is obviously impossible to detail the known facts concerning the various diseases of man. In the mind of the reviewer the best feature of this new and completely revised edition on clinical medicine for nurses is the excellent evaluation of the proper amount of information that should be given. Furthermore, the unusual diseases are omitted and only the common ones are described. This alone makes the book stand out, but added to this well selected material—the clear-cut description of disease, the well-balanced directions for the care of the sick, and the excellent literary style make it a book of undoubted merit.

J. H. MUSSER, M. D.

Hookworm Disease. Its Distribution, Biology, Epdemiology, Pathology, Diagnosis, Treatment and Control: By Asa C. Chandler, M. Sc., Ph. D. New York. The Macmillan Co. 1929. Pp. 492.

The tremendous amount of data on hookworm disease which has accumulated within the past two decades has made it almost imperative that some worker personally acquainted with the various phases of the subject should present it in comprehensive form for the medical public. This valuable service has now been performed by Doctor Chandler, whose experience with both the laboratory and field aspects of hookworm disease

are well recognized. In this instance intimate knowledge of the subject is combined with marked ability as a writer.

The book consists of ten main chapters, an appendix on laboratory technic, a valuable bibliography and a comprehensive index. An introductory chapter deals with the history of the disease. There follow in turn the georgraphic distribution of the disease, the adult hookworms, their life cycle and mode of infection, the epidemology (environmental and human factors), pathology, diagnosis, treatment, prevention and control. Thirty-three well-chosen figures add value to the several phases of the subject.

The reviewer is impressed with the balance and unity of the work as well as the impartial way in which the many contributions to the subject are evaluated. The pleasing typography and bookmanship enhance its appearance. The volume is highly recommended for all workers in hookworm areas, as well as for others interested in the subject.

ERNEST CARROLL FAUST, Ph. D.

Recent Advances in Tropical Medicine: By Leonard Rogers, C. I. E., M. D., B. S. (Lond.) F. R. C. P., F. R. C. S., F. R. Second Edition. Philadelphia, Blakiston's Son & Co. 1929. Pp. 439.

The publication of a second edition of this volume is presumptive evidence of the success of the earlier edition. The compilation, which covers in twenty-five chapters all of the diseases usually considered in an unabridged manual of tropical medicine, is really a pocket handbook on the subject and actually presents in brief form all of the important contributions to the subject within the past quarter century. The several chapters include in the order of their presentation the following: kala azar, dermal leismaniasis, malaria, blackwater fever, trypanosomiasis, relapsing fever, yellow fevtr, dengue, undulant fever, plague, cholera, bacillary dysentery, flagellage diarrhae, amebiasis, and amebic hepatitis, sprue, "ankylostomiasis," schistosomiasis, filariasis, "other helminthic medicine," leprosy, yaws, granuloma inguinale, beriberi, and pellagra.

While it is rather remarkable that so much is comprehended in so small an octavo volume, and while there is no evident prejudice on the part of the author with respect to the conflicting views held regarding the etiology and other aspects of many of these diseases, there is a marked lack of polish and skill in the presentation of the material such as might have been expected in this type of digest. Furthermore, there is an unfortunate lack of balance 'n the subject matter. Individual case histories are at times cited in *extenso*, while only brief mention is made of epochal studies embracing large series of cases. Likewise a lack of synthesis of the data adds to the difficulty of reading.

Slips in orthogpraphy are not uncommon. The term "preventative" appears several times, as does the word "helmintic." Omission of the German umlaut is consistent throughout the earlier chapters, but is at times indicated in the later pages. Expressions such as an investigator "of great experience" are repeated so frequently as to be monotonous.

The author is at his best when presenting amebic infections and their treatment, but on several other topics he gives the impression of incomplete digestion of the material. On the whole, when original sources are not available, the reviewer prefers to get his material from the excellent abstracts in the Tropical Diseases Bulletin.

ERNEST CARROLL FAUST, Ph. D.

The Female Sex Hormone: By Robert T. Frank, M. A., M. D., F. A. C.S. Springfield and Baltimore. Charles C. Thomas. 1929. Pp. 321.

The publication of this book is timely. In the last quarter of a century the new science of endocrinology has come into being, and, along with much good, it has spawned a host of evils. Of all its aspects none is in greater need of clarification than that of the female sex hormone, and no man is more fitted to elucidate it than the distinguished gynecologist and pathologist who has written this monograph.

The first section of the book has to do with the biology, pharmacology and chemistry of the female sex hormone, whose constitution, the author is careful to point out, is not yet clearly understood, though its origin and distribution, thanks in large part to his own painstaking investigations, may now be stated definitely. For the sake of completeness, this section contains also a comprehensive outline of the anatomy and physiology of the genital tract, and here, as elsewhere, one must admire the author's enviable grasp of these sciences in the lower organisms as well as in the human species. Part II comprises the clinical investigations based on the female sex hormone. In short, this book includes in concise and available and, it should be said, readable form, the essential matter of the very voluminous literature which has grown up around this subject, summarized by the scientist who, with his co-workers, has helped to make its history.

It is unnecessary, as it would be impossible, to outline in this brief compass the important points of the book, but certain comments I cannot refrain

from. In the first place, Dr. Frank, unlike many scientific writers, has no thesis to present. He merely states facts, but those facts are based on investigations and experiments so elaborate and so comprehensive that their verity cannot be questioned. In the second place, unlike much scientific writing, this book is remarkable for its clearness both of outline and of style, and its usefulness is enhanced by the very excellent summary and review of the subject which forms the concluding chapter. In the third place, the author is not only fair in his bestowal of credit upon other workers, but he is unusually generous, especially toward that group from whom, it would seem almost wilfully, he has suffered from mis-quotation and misinterpretation. And finally, to every physician, and particularly to those who are inclined to assign dysfunction of the endocrine glands all of the ills to which womankind, at least, is heir, I would commend two chapters. The first is that in which the author describes the proper examination of the gyneocologic patient and stresses the fact that pathology of the endocrine system is a last diagnosis, to be accepted only after the painstaking elimination of general and local disease. The other is that in which he weighs impartially his own clinical results with endocrine therapy, and points out that, until a concentrated and stable preparation is at hand—which is not the case at present—treatment by the female sex hormone in the form of commercial preparations is unscientific and empiric. In these days of enthusiastic claims by pharmaceutical houses and apparently equally enthusiastic reports from the profession, this statement, in view of the source from which it emanates, is worthy of earnest consideration.

Dr. Frank has for many years done a work of exceeding worth in the study of the female sex hormone. I am not sure that he has not equalled it in value by the publication of this concise, lucid and impartial treatise.

C. Jeff Miller, M. D.

Principles and Practice of Electrocardiography: By Carl J. Wiggers, M. D. St. Louis, C. V. Mosby Company, 1929. Pp. 226.

The author's position as an outstanding teacher of physiology, who has devoted a great deal of his time to cardiac studies, places him in an enviable position in this field. The book is the outgrowth of the lectures that he has given on the subject to medical students during the past decade. It is logically arranged, basically sound, and presented in such a way that the student or practitioner can grasp the fundamentals of the subject and really understand what he is working with. Any one interested enough to be working in the field should have a clear conception of these principles, and he will find them more clearly detailed here.

There is slightly more emphasis and more space devoted to various types of instruments than the reviewer would consider necessary. The author has placed all of these imparitally before the reader, and he has not emphasized especially the advantages of one equipment over another, nor has he indicated his preference. The matter of the choice of the type of instruments he delegates to the individual.

The clinical side of electrocardiography might have received a bit more practical and extensive treatment, but after all this comes with a little experience after a good foundation has been established along the physiological lines of the author. The work is especially adapted for the medical man who wishes to acquaint himself thoroughly with the subject of electrocardiography and be able to practice the art scientifically. From this point of view the book has no superiors and few equals.

George Herrmann, M. D.

Applied Electrocardiography: By Aaron E. Parsonnet, M. D., F. A. C. P., and Albert S. Hyman, A. B., M. D., F. A. C. P. New York, The Macmillan Company. 1929. Pp. 206. 114 figures.

In so far as this book makes an attempt to break away from the traditional methods of presentation of electrocardiography it is to be commended. After the usual brief discussion of essential anatomical and physiological facts, of various types of electrocardiographs and of technique, the authors take up those disturbances of the cardiac mechanism resulting from disease of the pacemaker, of the auricles of the conducting system, of the ventricles and of the coronary arteries. Because of the fact that extrasystoles may arise from almost any region of the heart, their mechanism and significance is, discussed separately. Short chapters follow on electrocardiographic changes in acute infectious diseases and in valvular disease. The final chapter, in tabular form, deals with the analysis of electrocardiographic tracings.

By their arrangement of the material, the authors are better able to place the emphasis where it should be placed in a book intended for the clinician, namely, upon the clinical significance of the electrocardiographic changes. At the same time, the details of electrocardiographic interpretation are intentionally slighted. The reader is apparently expected to leave this aspect of the subject to the technician or the specialist. Con-

sequently, the work is not one from which the novice should expect to learn electrocardiography. Nor will the seeker after a fundamental physiological foundation fare any better.

Perhaps the reviewer is somewhat too critical, for in his opinion few of the books on electrocardiography are entirely satisfactory. Thomas Lewis' books, particularly "The Mechanism and Graphic Representation of the Heart Beat," represent the highest standard of excellence. But they are difficult for the beginner. Of the less ambitious works, H. E. B. Pardee's "Clinical Aspects of the Electrocardiogram" is probably the best of those with which the reviewer is familiar. The volume here reviewed is certainly better than several others. Yet the reader will no doubt be startled to learn that the P-R interval "is remarkably constant, measuring about 0.16 seconds in nearly all mammals" (p. 6); that, in spite of the extensive experimental and analytical work of Garry, of Mines, and of Lewis and his co-workers, the circus movement explanation of auricular flutter is regarded as an assumption (p. 102); that in acquired dextrocardia reversal of the arm electrodes will cause no change in the electrocardiogram in lead I (p. 183); and that partial heart block results from disease of the auricular muscle (p. 124). Some of us may regret the omission from the bibliography of the really classical papers by F. N. Wilson and G. R. Hermann on bundle branch block.

With the interpretations of the illustrative electrocardiograms the reviewer is in substantial agreement, with exception of figures 88 and 89.

RICHARD ASHMAN, M. Sc.

Esophageal Obstruction Its Pathology, Diagnosis and Treatment: By A. Lawrence Abel, M. S. (Lond.), F. R. C. S. (Eng.) London Oxford University Press. 1929. Pp. 234.

This book is based on the Jacksonian prize essay of the Royal College of Surgeons of England for 1924, and includes a Hunterian lecture delivered at the Royal College of Surgeons in 1926.

All types of esophageal obstruction are considered and the author stresses the importance of the condition by the remark that many thousands of individuals die every year in England alone from various forms of obstructions of the esophagus.

In his endoscopic work Abel usually employs the Jackson, Mosher and Brunings instruments. He does not mention the Tucker retrograde esophageal bougie which is regarded with great favor in this country.

In cases of esophageal obstruction requiring gastrostomy the author does a modification of the Witzel operation.

The problem of removal of esophageal foreign bodies is gone into in some detail.

Cardiospasm is described and the various methods of treatment mentioned.

The pathology, diagnosis and treatment of pharyngo-esophageal divertícula is one of the most noteworthy sections of the book.

The section on cancer of the esophagus is comprehensive. Abel feels that radical surgery is justifiable, and says "The disease is so fatal, in the absence of any contra indication, such as metastases or extreme emaciation, radical removal should always be attempted." He recalls that when Billroth began operating on the stomach some fifty years ago many of his patients died; but today operations on the stomach are performed by all surgeons with extremely low mortality. The author shows laudable and courageous optimism when he says "With more adequate education and earlier investigation of cases and the application of the principles which I have enunciated, there would appear to be no reason why malignant disease of the gullet should not be treated so effectively that before long, instead of claiming virtually 100 per cent of its victims as it does at the present time, it will be the most favorable type of cancer with which the surgeon has to deal."

H. KEARNEY, M. D.

The Handbook on Diet: By Eugene E. Marcovici, M. D. Philadelphia, F. A. Davis Co. 1928. p. 323.

The Handbook on Diet is what its name implies. It was written, as may be observed in the preface, as a "go between" to the very scientific texts and reference books, and the incomplete reading matter given to the laity to assist intelligently in carrying out doctor's orders.

The first five chapters deal with types of food, its utilization and contamination.

Chapter six deals with the diet for the healthy, this chapter outlines the kind of diet used; for those persons termed overweight and underweight, for childhood and adolescence, in pregnancy, during confinement, and for the aged. As one would surmise, it is not complete in any one case; for example, it states "The growing youth does not need a special form of diet as the normal child's diet is well regulated by his appetite and natural selection of food substances in their proper proportion," which may or may not be true. The subject of supplying the proper foods from which

he can make this selection has been thought, by some, sufficiently important to be the subject of an entire book.

The chapters on diet in disease and special diets are more complete, as they treat of the diet in almost every disease, and in general follow the paths of the most accepted works. An Oriental remedy for pertusis in this chapter is rather interesting. Such remedies remind us of the old remedies that our grandmothers handed down to use from generation to generation. They are often very effective though simple. We observe that the author of this book is under the impression that pellagra is due to an excessive maize diet, and recommends a complete change of diet omitting all maize foods.

Of the recipes, in Chapter IX, those desserts for diabetics make it worth while, since the regular recipes contain far too much carbohydrates for the diabetics, and no one craves desserts quite as much as they. All of the recipes seem to be good.

The food values and chapter on mineral waters and bath resorts complete its contents.

All in all, it would not be considered a complete or an up-to-date scientific study, but perhaps it will accomplish the purpose for which it was written. Only time and use can prove that. It deals very lightly in the selection of foods, except in disease, and not at all in infant feeding; even in disease of children only the general plan for the adult is suggested.

One hears of such drastic changes in the theories of dietetics that it would be interesting to watch the experimental results; an example is the high protein diet for nephritis, recommended by a few men, who are afraid to bring down the volume of criticism that such a radical change would incur.

OLIVE WAKEFIELD.

Bodily Changes in Pain, Hunger, Fear and Rage: By Walter B. Cannon, M. D., S. D., LL. D. New York, Appleton & Company. 1929. Second edition. Fig. 43, pp. 404.

This edition, dedicated to the thirty-four collaborators from various parts of the world who have aided Professor Cannon, embodies the new evidence gathered since 1915 as well as the revised evidence set forth in the First Edition on the general thesis that the bodily changes which attend great excitement are directed towards efficiency in physical struggle. The chapters on the James-Lange theory of emotions and on an alternative view of emotion as a function of the optic thalamus are perhaps the most interesting to the general reader.

HENRY LAURENS, Ph. D.

PUBLICATIONS RECEIVED.

The Year Book Publishers, Chicago: The Practical Medicine Series, General Medicine, Series 1929.

W. B. Saunders Company, Philadelphia and London: The Volume of the Blood and Plasma and Disease, by Leonard G.

Princeton University Press, Princeton: Ameboid Movement, by Asa A. Schaeffer, Ph. D.

Harper & Brothers, New York and London: The Treatment of Diabetis Mellitus with Higher Carbohydrate Diets, by William David Sansum, M. S., M. D., F. A. C. P., Percival Allen Gray, Ph. D., M. D., and Ruth Bowden, B. S.

F. A. Davis Company, Philadelphia: Hemorrhoids, the Injection Treatment and Pruritus Ani, by Lawrence Goldbacher, M. D. Clinical Obstetrics, by Paul T. Harper, Ph. B., M. D., Sc. D., F. A. C. S.

Williams & Wilkins Company, Baltimore: Conorary Thrombosis: Its various Clinical Features, by Samuel A. Levine, Medicine Monographs, Volume XVI. Blood Grouping in Relation to Clinical and Legal Medicine, by Laurence H. Snyder, Sc. D.

Oxford University Press, London and New York: The Nervous Child, by Hector Charles Cameron, M. A., M. D.

Brentano's Lt., 31 Gower Street, London, W. C. I: Testicular Grafting from Ape to Man, by Serge Vornoff and George Alexandrescu, translated by Theodore C. Merrill, M. D.

Government of India Press, Calcutta: Report of the 7th Congress of the Far Eastern Association of Tropical Medicine, British India, December 5th-10th-24th, 1927.

C. V. Mosby Company, St. Louis: Cerebrospinal Fluid, by Abraham Levinson, M. D.